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

CLIVETPack^2

CSRN-XHE2 49.4 - 110.4 RANGE

TECHNICAL BULLETIN

R-410A

ErP 2021 COMPLIANT

SIZE	49.4	54.4	60.4	70.4	80.4	90.4	100.4	110.4
COOLING CAPACITY kW	154,6	164,6	195,0	213,0	245,2	297,3	311,9	333,6
HEATING CAPACITY kW	161,1	171,9	198,9	220,6	255,1	302,1	323,1	350,0

EUROVENT CERTIFIED PERFORMANCE

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 CSRN-XHE2 units are high-efficiency stand-alone air conditioners designed for medium and large commercial areas. They are specific for use in medium crowded environments such as: shopping centres, shopping arcades, supermarkets, hypermarkets, railway stations, airports and industrial warehouses.
The 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 four main configurations, from the full recirculation version, with minimum fresh air, to versions with renewal and energy recovery on the exhaust air. Each one can be integrated with a broad range of accessories that customise the product according to the application.

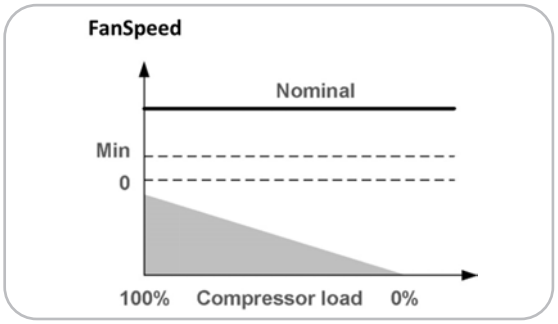
- ✓ Independent dual refrigeration circuit with two scroll compressors connected in parallel that allow for up to 3 partialisation steps per circuit.
- ✓ Radial fans directly coupled to EC brushless motors (plug fans) permit control of the airflow for adapting to the characteristics of the aeraulic system. 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.
- ✓ Humidification systems integrated in the unit.
- ✓ Possibility of connection to the main supervision 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

Standard mode

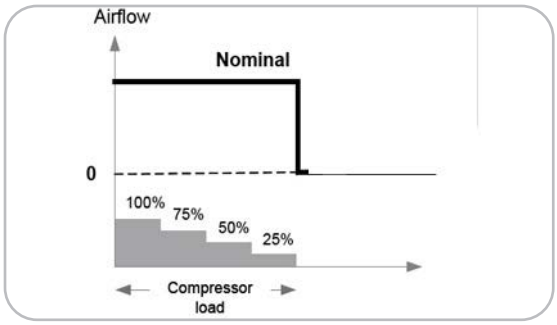
The supply airflow is managed with 0-10V signal.
The signal remains constant and keeps the fan speed consistent in all thermal load conditions and operating mode.



ECO mode (standard function)

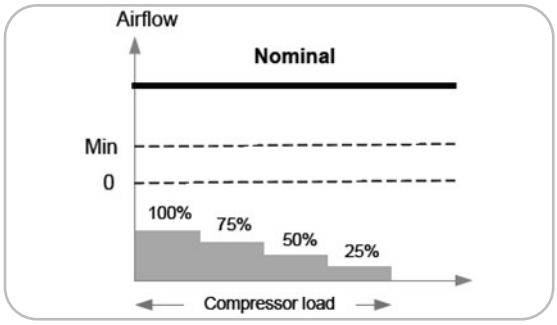
The air flow supply remains constant at varied heat loads and is shutdown when the load is fulfilled (dead zone).
To further increase the energy savings in this condition, it is also possible to set less demanding operation setpoints for the unit in respect to the standard mode.
This function is indicated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



Constant airflow (PCOSM option)

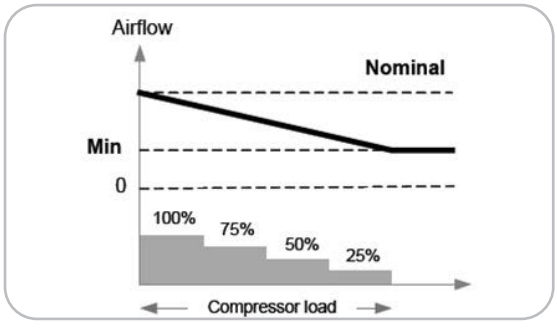
The supply airflow remains constant even if the filters get progressively clogged, thus compensating for the increased load drops.



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

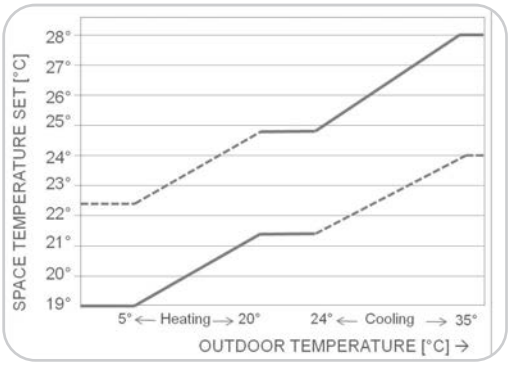
The automatic defrost cycles on the remaining external exchanger surface are managed in predictive mode, reducing both the frequency and the duration. The built-in electronics analyses not only the external conditions, but also the evaporation pressure variation in the exchanger.

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:

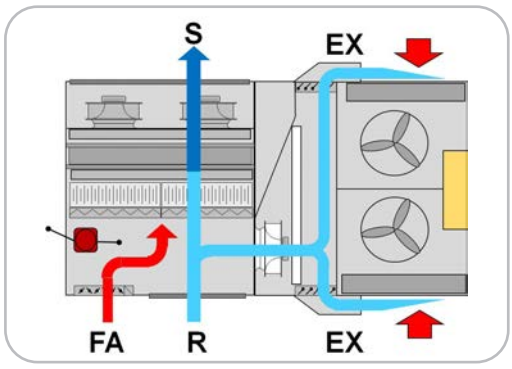
- further increases the energy saving;
- reduces the temperature difference between the outside and the served area, increasing the user comfort.



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.

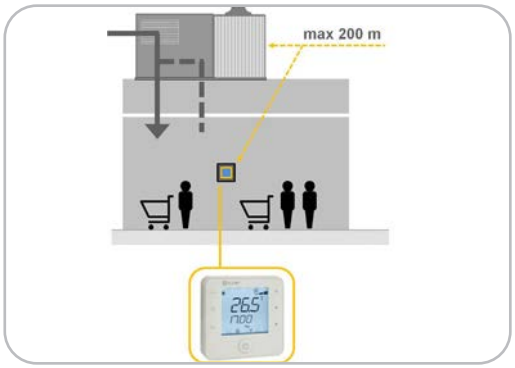
The room pressure control device is fitted as standard in the units with extraction and exhaust (Clivet reference code CCK and CCKP)



Simple and intuitive user interface

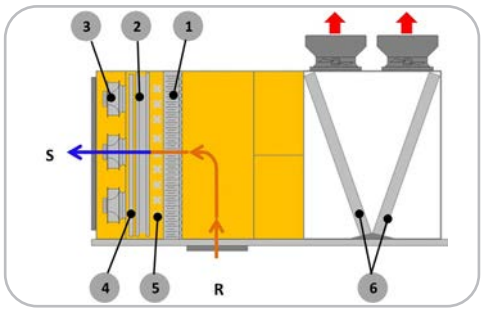
An innovative graphic interface prepared for wall-installation (with 230V power supply and wiring at the customer's care) is supplied as standard, with the option to be removed from the support and connected on-board for maintenance operations.
Among the main functions it allows to:

- 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.



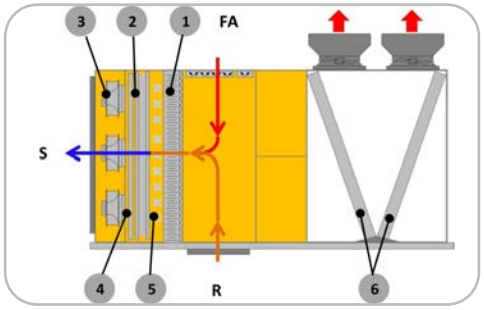
CAK - Configuration: single fan section for full recirculation

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



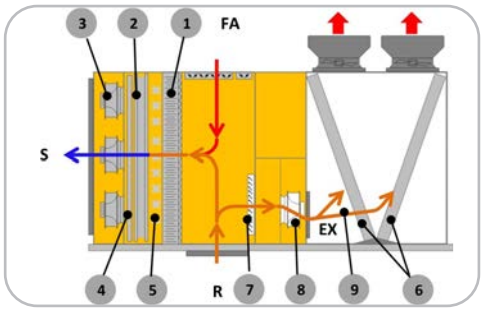
CBK - configuration: single fan section for recirculation and fresh air

For applications where you need to keep the room in over-pressure, with the option of controlling a particular fresh air flow.
As for the CAK configuration, the supply fan section provides the supply and return available static pressure



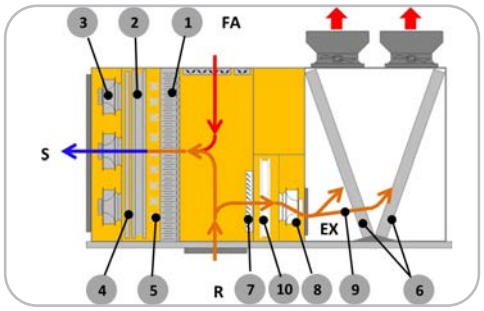
CCK - double fan section for recirculation, fresh air, exhaust, thermodynamic recovery

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.
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 innovative THOR recovery is always included in the CCKP configuration and uses direct expansion refrigeration circuit technology.
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

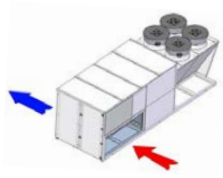
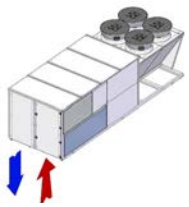
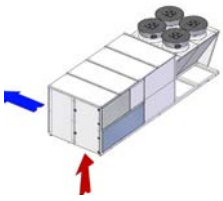
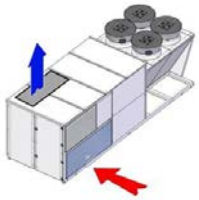
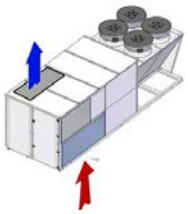
1. First and second filtration stage (opt.)
2. Handling exchanger
3. Supply fan section
4. Hot gas reheating exchanger
5. Electric heaters.
6. Source side exchanger
7. Exhaust damper
8. Exhaust fan section
9. Thermodynamic recovery on exhaust air
10. Thermodynamic recovery exchanger, THOR

Unit configurations

MODEL	VERSION	SIZE							
CSRN-XHE2	**CAK** - Full recirculation **CBK** - Fresh air **CCK -** FREE-COOLING, thermodynamic recovery **CCKP -** FREE-COOLING, THOR thermodynamic recovery	49.4	54.4	60.4	70.4	80.4	90.4	100.4	110.4

FUNCTIONALITIES

Air supply and return

M0 - R0	M3 - R3	M0 - R3
Standard unit	Option	Option
		
M3 - R0	**M5 - R0**	**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 single fan section for full recirculation (CAK) and for recirculation and fresh air (CBK)

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

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

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

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

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

Fan
Internal section
Plug fans without scroll with reverse blades driven by electronically-controlled “brushless” dc motors with direct coupling. No transmission sizing is needed. 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.

Refrigeration circuit
Refrigeration circuit with:
- refrigerant charge;
- sight glass with moisture and liquid indicator;
- high pressure safety pressure switch;
- low pressure safety switch;
- filter dryer;
- electronic expansion valve;
- 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 drain pipe.

Electrical panel
The electrical panel is positioned inside the units, with access through a swing door that is opened by a special key.

The capacity section includes:
- main door lock isolator switch;
- compressor circuit breaker;
- compressor power supply remote control switch;
- fan motor thermal protections of internal and external section;
- circuit breaker to protect auxiliary circuit.

The microprocessor control section includes:
- compressor overload protection and timer;
- Demand limit;
- potential-free contacts for remote ON-OFF, cumulative alarm, fire alarm inlet, fan status, compressor status, summer/winter mode;
- phase monitor;
- RJ45 located on the unit’s outer surface for inspection and maintenance operations.

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

Standard unit technical features

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
- PCOSM - Constant supply airflow
- PVAR - Variable airflow
- FCE - Enthalpy FREE-COOLING
- PAQC - Air quality probe for CO2 rate check
- PAQCV - Air quality probe for CO2 and VOC rate check
- MHP - High and low pressure gauges
- CPHG - Hot gas re-heating coil
- EH - Electric heaters
- CHW2 - Two-rows hot water coil
- 3WVM - Modulating 2-way valve
- 2WVM - Modulating 3-way valve
- 3WVM - Modulating 3-way valve for energy recovery from food refrigeration
- CHWER - Energy recovery from the food refrigeration
- 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
- MOB - Serial port RS485 with Modbus protocol
- LON - LonWorks serial communication module
- BACIP - BACnet-IP serial communication module
- DESM - Smoke detector
- MF2 - Multi-function 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

- SIX - Service interface
- CLMX - Clivet Master System RCX - Roof curb
- RCX - Roof curb
- AMRX - Rubber antivibration mounts

All exchangers can be covered with aluminium - fin guard - copper/copper.

Test

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

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

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

Modulating motorized outdoor air damper for renewal and e FREE-COOLING

Exhaust fan

Plug fans without scroll with reverse blades driven by electronically-controlled “brushless” DC motors with direct coupling.
No drive sizing is required.

Thermodynamic recovery on the exhaust air

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

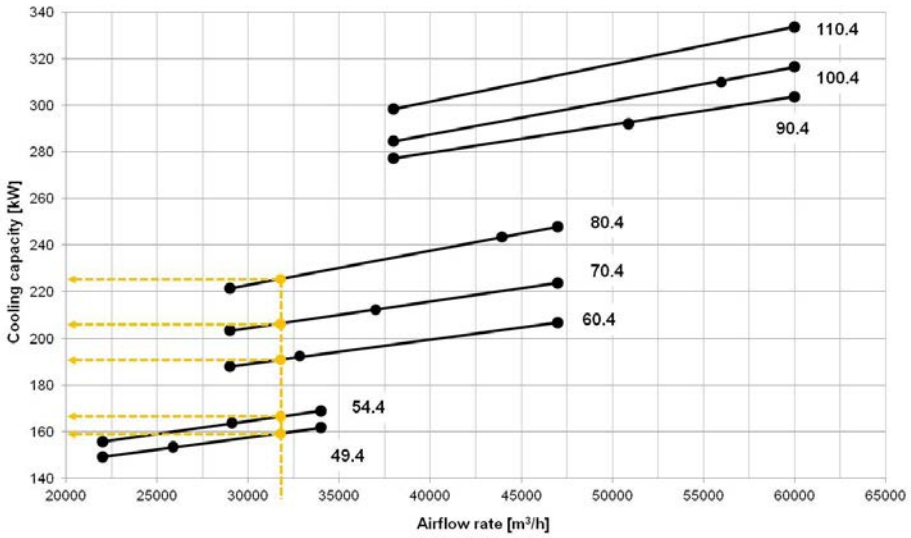
Configuration with double fan section for recirculation, fresh air, exhaust, THOR thermodynamic recovery (CCKP)

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

Exchanger for thermodynamic recovery - THOR

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

The broad CLIVETPack CSRN-XHE2 series



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

General technical data

Standard airflow

SIZE				49.4	54.4	60.4	70.4	80.4	90.4	100.4	110.4
COOLING											
Cooling capacity		1	kW	154,6	164,6	195,0	213,0	245,2	297,3	311,9	333,6
Sensible capacity		1	kW	116,3	124,3	143,6	164,2	184,2	222,8	234,7	246,0
Compressor power input		1	kW	40,9	45,0	49,9	58,4	64,7	75,7	84,1	94,7
EER		1	-	3,78	3,66	3,91	3,64	3,79	3,93	3,71	3,62
Cooling capacity (EN14511:2018)	CAK	11	kW	152,5	160,8	192,5	209,6	240,2	291,9	305,9	326,3
EER (EN14511:2018)		11	-	3,29	3,09	3,24	3,05	3,15	3,22	3,05	2,91
SEER		12		4,56	3,98	4,41	4,29	4,28	4,63	4,12	3,91
ηsc		12	%	179,6	156,2	173,4	168,5	168,3	182,0	162,0	153,3
EER - EN14511-2018		1		3,29	3,09	3,24	3,05	3,15	3,22	3,05	2,91
Cooling capacity		2	kW	161,2	171,3	202,9	223,2	257,6	310,1	328,2	346,8
Sensible capacity	CBK	2	kW	119,4	128,6	148,7	167,3	187,8	229,3	238,0	253,8
Compressor power input		2	kW	41,5	45,5	50,6	59,5	65,5	76,8	85,7	96,2
EER		2	-	3,88	3,76	4,01	3,75	3,93	4,04	3,83	3,60
Cooling capacity		3	kW	164,2	175,1	206,0	227,1	262,5	314,7	333,2	353,0
Sensible capacity	CCK	3	kW	121,2	130,7	150,2	169,0	190,3	231,9	240,8	256,9
Compressor power input		3	kW	40,2	43,9	49,4	58,1	63,6	74,9	83,5	93,6
EER		3	-	4,08	3,99	4,17	3,91	4,13	4,20	3,99	3,77
Cooling capacity		3	kW	174,9	185,9	220,2	242,1	279,5	336,4	356,0	376,2
Sensible capacity	CCKP	3	kW	128,7	138,6	160,2	180,3	202,4	247,1	256,5	273,6
Compressor power input		3	kW	41,1	45,1	50,1	59,0	65,1	76,4	85,1	95,3
EER		3	-	4,26	4,12	4,40	4,10	4,29	4,40	4,18	3,95
RISCALDAMENTO											
Heating capacity		1	kW	161,1	171,9	198,9	220,6	255,1	302,1	323,1	350,0
Compressor power input		1	kW	34,4	36,9	42,5	48,6	55,4	64,8	69,9	79,2
COP		1	-	4,68	4,66	4,68	4,54	4,60	4,66	4,62	4,42
Heating capacity (EN14511:2018)	CAK	13	kW	149,8	158,7	185,4	208,9	235,1	285,3	302,8	326,8
COP (EN14511:2018)		13	-	3,53	3,43	3,43	3,37	3,36	3,41	3,33	3,24
SCOP		12		3,65	3,42	3,39	3,35	3,38	3,35	3,30	3,40
ηsh		12	%	143	134	133	131	132	131	129	133
COP- EN14511-2018		1		3,53	3,43	3,43	3,37	3,36	3,41	3,33	3,24
Heating capacity		2	kW	163,5	174,3	202,5	223,7	258,9	306,2	327,4	354,5
Compressor power input	CBK	2	kW	31,7	33,8	39,0	44,8	51,3	60,1	65,1	72,6
COP		2	-	5,16	5,16	5,19	4,99	5,05	5,09	5,03	4,88
Heating capacity		3	kW	167,8	179,3	206,4	228,7	265,4	311,7	333,4	361,9
Compressor power input	CCK	3	kW	32,1	34,2	39,4	45,4	51,9	61,1	65,8	73,6
COP		3		5,23	5,24	5,24	5,04	5,11	5,10	5,07	4,92
Heating capacity		3	kW	176,3	186,6	218,3	241,2	279,1	330,1	353,0	382,2
Compressor power input	CCKP	3	kW	32,8	36,5	40,3	46,3	53,0	62,1	67,3	75,0
COP		3		5,38	5,11	5,42	5,21	5,27	5,32	5,25	5,10
THOR recovery efficiency		4	%	91	88	94	93	87	84	84	85
COMPRESSOR											
Type of compressors		5		Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
No. of compressors			Nr	4	4	4	4	4	4	4	4
Std Capacity control steps			Nr	6	6	4	6	6	6	6	6
Refrigerant charge (C1)		6	kg	31	38	38	34	50	64	67	67
Refrigerant charge (C2)		6	kg	38	38	38	34	50	64	67	67
Refrigeration circuits			Nr	2	2	2	2	2	2	2	2
AIR HANDLING SECTION FANS (SUPPLY)											
Type of supply fan		7		RAD	RAD	RAD	RAD	RAD	RAD	RAD	RAD
No. of supply fans			Nr	3	3	4	4	4	6	6	6
Fan diameter			mm	560	560	560	560	560	560	560	560
Supply airflow			m^3/h	26000	29000	33000	37000	44000	51000	56000	60000
Supply airflow			l/s	7222	8056	9167	10278	12222	14167	15556	16667
Installed unit power			kW	2,90	2,90	2,90	2,90	2,90	2,90	2,90	2,90
Max. static pressure supply fan		8	Pa	630	540	660	570	360	620	540	460

SIZE				49.4	54.4	60.4	70.4	80.4	90.4	100.4	110.4
HIGH STATIC PRESSURE AIR HANDLING SECTION FANS (OPTIONAL)											
Type of supply fan				RAD	RAD	RAD	RAD	RAD	RAD	RAD	RAD
No. of supply fans			Nr	3	3	4	4	4	6	6	6
Fan diameter			mm	500	500	500	500	500	500	500	500
Supply airflow			l/s	26000	29000	33000	37000	44000	51000	56000	60000
Supply airflow			m^3/h	7222	8056	9167	10278	12222	14167	15556	16667
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	1140	1080	1140	1140	900	1140	1140	1020
FANS (EXHAUST) (ONLY CCK, CCKP-THOR CONFIGURATION)											
Type of fans		7		RAD	RAD	RAD	RAD	RAD	RAD	RAD	RAD
No. of fans		9	Nr	2	2	2	2	2	2	2	2
Installed unit power		9	kW	2,60	2,60	2,70	2,70	2,70	2,70	2,70	2,70
EXTERNAL SECTION FANS											
Type of fans				AX	AX	AX	AX	AX	AX	AX	AX
No. of fans			Nr	2	2	4	4	4	6	6	6
Supply airflow			l/s	12500	12500	23333	23333	23333	35000	35000	35000
Max. static pressure supply fan			kW	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5
CONNECTIONS											
Condensate drain			mm	30	30	30	30	30	30	30	30
POWER SUPPLY											
Standard power supply			V	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50

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)
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
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

1. Performance refers to operation at full re-circulation
2. Performance with 30% of outdoor air
3. Performance with 30% of outdoor air including the energy recovery on the exhaust air
4. 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.
5. SCROLL = scroll compressor
6. Indicative values for standard units with possible +/-10% variation. The actual data are indicated on the label of the unit
7. RAD = radial fan electronically controlled
8. Net outside static pressure to win the outlet and intake onboard pressure drops
9. Configuration with double fan section for recirculation, fresh air, exhaust, thermodynamic recovery (CCK) and configuration with double fan section with fresh air and THOR thermodynamic recovery (CCKP)
10. AX = axial fan
11. 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
12. Data calculated in accordance with EN 14825: 2018
13. 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)
49.4	99	95	98	88	84	75	70	67	72	92
54.4	101	95	95	90	87	78	74	72	72	92
60.4	105	95	95	91	86	80	75	73	72	93
70.4	106	96	95	92	88	83	77	75	73	94
80.4	106	97	96	93	89	82	77	75	74	95
90.4	107	101	100	94	92	85	79	78	76	97
100.4	108	102	101	95	93	86	80	79	77	98
110.4	109	103	102	96	94	87	81	80	78	99

The sound levels are referred to unit operating at full load in nominal conditions. The sound pressure level is referred at a distance of 1 m. from the ducted unit surface operating in free field conditions. External static pressure 50 Pa. (standard UNI EN ISO 9614-2)
Please note that when the unit is installed in conditions different from nominal test conditions (e.g. near walls or obstacles in general), the sound levels may undergo substantial variations.

Electrical input of optional components

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

SIZE			49.4	54.4	60.4	70.4	80.4	90.4	100.4	110.4
F.L.A. ABSORBED CURRENT										
F.L.A. EH20 - 24 kW electric elements		A	34,6	34,6	34,6	34,6	34,6	34,6	34,6	34,6
F.L.A. EH24 - 36 kW Heating elements		A	52,0	52,0	52,0	52,0	52,0	52,0	52,0	52,0
F.L.A. EH28 - 48 kW electric elements		A	69,4	69,4	69,4	69,4	69,4	69,4	69,4	69,4
F.L.A. HSE8 - Immersed electrodes steam humidifier of 8 kg/h		A	8,7	8,7	8,7	8,7	8,7	8,7	8,7	8,7
F.L.A. HSE9 - Immersed electrodes steam humidifier of 15 kg/h		A	16,2	16,2	16,2	16,2	16,2	16,2	16,2	16,2
F.L.A. LTEMP1 - Application for low outdoor temperature		A	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0
F.L.A. VENH - High static pressure fans	1	A	11,9	11,9	15,9	15,9	15,9	23,8	23,8	23,8
F.L.I. POWER INPUT										
F.L.I. EH20 - Electric elements of 24 kW		kW	24,0	24,0	24,0	24,0	24,0	24,0	24,0	24,0
F.L.I. EH24 - 36 kW heating elements		kW	36,0	36,0	36,0	36,0	36,0	36,0	36,0	36,0
F.L.I. EH28 - 48 kW electric elements		kW	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0
F.L.I. HSE8 - Immersed electrodes steam humidifier of 8 kg/h		kW	6,0	6,0	6,0	6,0	6,0	6,0	6,0	6,0
F.L.I. HSE9 - Immersed electrodes steam humidifier of 15 kg/h		kW	11,3	11,3	11,3	11,3	11,3	11,3	11,3	11,3
F.L.I. LTEMP1 - Application for low outdoor temperature		kW	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3
F.L.I. VENH - High static pressure fans	1	kW	7,8	7,8	10,4	10,4	10,4	15,6	15,6	15,6

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

Electrical data

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

SIZE			49.4	54.4	60.4	70.4	80.4	90.4	100.4	110.4
F.L.A. - Full load current at max admissible conditions										
F.L.A. - Compressor 1		A	15,4	23,0	30,9	30,9	30,9	30,9	36,5	44,6
F.L.A. - Compressor 2		A	30,9	30,9	30,9	36,5	44,6	59,3	59,3	59,3
F.L.A. - Compressor 3		A	23,0	23,0	30,9	30,9	30,9	30,9	36,5	44,6
F.L.A. - Compressor 4		A	30,9	30,9	30,9	36,5	44,6	59,3	59,3	59,3
F.L.A. - Single External Fan		A	3,9	3,9	3,9	3,9	3,9	3,9	3,9	3,9
F.L.A. - Single supply fan		A	4,4	4,4	4,4	4,4	4,4	4,4	4,4	4,4
F.L.A. - Total	1	A	122,1	129,7	157,7	168,9	185,1	231,2	242,3	258,6
L.R.A. - Locked rotor amperes										
L.R.A. - Compressor 1		A	95,0	118,0	174,0	174,0	174,0	174,0	225,0	272,0
L.R.A. - Compressor 2		A	174,0	174,0	174,0	225,0	272,0	310,0	310,0	310,0
L.R.A. - Compressor 3		A	118,0	118,0	174,0	174,0	174,0	174,0	225,0	272,0
L.R.A. - Compressor 4		A	174,0	174,0	174,0	225,0	272,0	310,0	310,0	310,0
F.L.I. - Full load power input at max admissible conditions										
F.L.I. - Compressor 1		kW	9,1	13,1	17,0	17,0	17,0	17,0	22,6	27,6
F.L.I. - Compressor 2		kW	17,0	17,0	17,0	22,6	27,6	36,1	36,1	36,1
F.L.I. - Compressor 3		kW	13,1	13,1	17,0	17,0	17,0	17,0	22,6	27,6
F.L.I. - Compressor 4		kW	17,0	17,0	17,0	22,6	27,6	36,1	36,1	36,1
F.L.I. - Single External Fan		kW	1,9	1,9	1,9	1,9	1,9	1,9	1,9	1,9
F.L.I. - Single supply fan		kW	2,9	2,9	2,9	2,9	2,9	2,9	2,9	2,9
F.L.I. - Total	2	kW	69,1	73,1	87,7	99,0	109,0	135,6	146,9	156,9
M.I.C. Maximum inrush current										
M.I.C. - Value		A	265,2	272,8	300,8	357,4	412,5	481,9	493,0	509,3

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

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

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

SIZE			49.4	54.4	60.4	70.4	80.4	90.4	100.4	110.4
F.L.A. - Full load current at max admissible conditions										
F.L.A. - Compressor 1		A	15,4	23,0	30,9	30,9	30,9	30,9	36,5	44,6
F.L.A. - Compressor 2		A	30,9	30,9	30,9	36,5	44,6	59,3	59,3	59,3
F.L.A. - Compressor 3		A	23,0	23,0	30,9	30,9	30,9	30,9	36,5	44,6
F.L.A. - Compressor 4		A	30,9	30,9	30,9	36,5	44,6	59,3	59,3	59,3
F.L.A. - Single External Fan		A	3,9	3,9	3,9	3,9	3,9	3,9	3,9	3,9
F.L.A. - Single supply fan		A	4,4	4,4	4,4	4,4	4,4	4,4	4,4	4,4
F.L.A. - Single exhaust air fan		A	4,0	4,0	4,3	4,3	4,3	4,3	4,3	4,3
F.L.A. - Total	1	A	130,0	137,6	166,3	177,5	193,7	239,8	250,9	267,2
L.R.A. - Locked rotor amperes										
L.R.A. - Compressor 1		A	95,0	118,0	174,0	174,0	174,0	174,0	225,0	272,0
L.R.A. - Compressor 2		A	174,0	174,0	174,0	225,0	272,0	310,0	310,0	310,0
L.R.A. - Compressor 3		A	118,0	118,0	174,0	174,0	174,0	174,0	225,0	272,0
L.R.A. - Compressor 4		A	174,0	174,0	174,0	225,0	272,0	310,0	310,0	310,0
F.L.I. - Full load power input at max admissible conditions										
F.L.I. - Compressor 1		kW	9,1	13,1	17,0	17,0	17,0	17,0	22,6	27,6
F.L.I. - Compressor 2		kW	17,0	17,0	17,0	22,6	27,6	36,1	36,1	36,1
F.L.I. - Compressor 3		kW	13,1	13,1	17,0	17,0	17,0	17,0	22,6	27,6
F.L.I. - Compressor 4		kW	17,0	17,0	17,0	22,6	27,6	36,1	36,1	36,1
F.L.I. - Single External Fan		kW	1,9	1,9	1,9	1,9	1,9	1,9	1,9	1,9
F.L.I. - Single supply fan		kW	2,9	2,9	2,9	2,9	2,9	2,9	2,9	2,9
F.L.I. – Single exhaust air fan		kW	2,6	2,6	2,8	2,8	2,8	2,8	2,8	2,8
F.L.I. - Totale	2	kW	74,3	78,2	93,2	104,5	114,5	141,1	152,4	162,4
M.I.C. Maximum inrush current										
M.I.C. - Value		A	273,1	280,7	309,4	366,0	421,1	490,5	501,6	517,9

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

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

Pressure drops of optional components

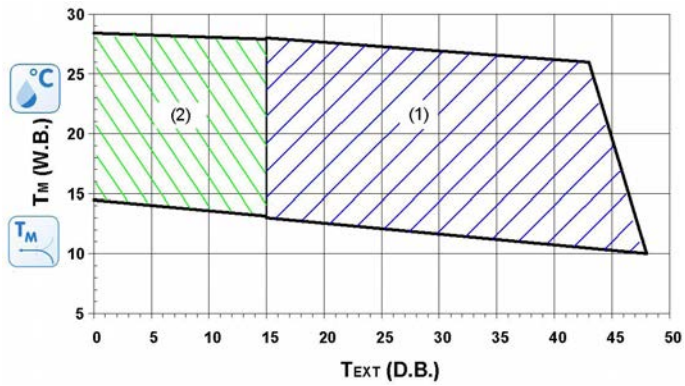
The value of static pressure available on the supply and return duct is obtained by subtracting from the available net maximum pressure (see general table of technical data) the pressure drops of any accessories.

SIZE			49.4	54.4	60.4	70.4	80.4	90.4	100.4	110.4
CHW2 - Two-row hot water coil		Pa	35	43	31	39	52	46	54	61
CPHG - Hot gas re-heating coil		Pa	18	20	19	21	25	23	26	28
CHWER - Energy recovery from food refrigeration		Pa	65	79	59	73	100	90	102	116
GC - Heating module		Pa	90	100	80	90	100	80	90	100
F7 - High efficiency F7 air filter (ISO 16890 ePM1 55%)	1	Pa	130	138	128	137	152	151	162	172
FES - Electronic filters (ISO 16890 ePM1 90%)		Pa	61	70	56	65	82	81	92	101

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

1. Pressure drops with filters with average dirtiness

Operating range (Cooling)



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

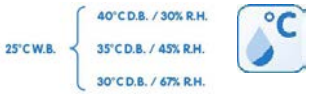
To verify the operation field of the operating units with percentages of outdoor air, always calculate the Tm mixing temperature at the internal heat exchanger input.

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

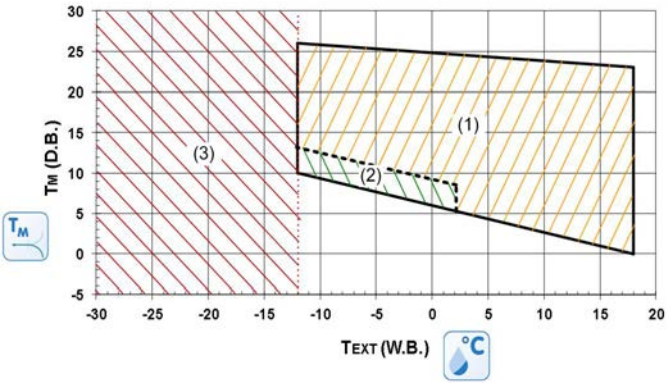
Text = Inlet air temperature in the external exchanger
dry bulb measured temperature (D.B.=DRY BULB)

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

WET BULB TEMPERATURE - EXAMPLE



Operating range (Heating)



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

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

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

Text = inlet air temperature in the external exchanger
temperature measured with wet bulb (W.B.=WET BULB)

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

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

Option compatibility

REF.	DESCRIPTION	CAK	CBK	CCK	CCKP
	Versions				
REC	Active energy recovery of the exhaust air (CCK version)	-	-	√	-
THR	THOR thermodynamic energy recovery of the exhaust air (CCKP version)	-	-	-	√
FC	Thermal FREE-COOLING	-	-	√	√
FCE	Enthalpy FREE-COOLING	-	-	O	O
	Configurations				
CREFP	Device for consumption reduction of the external section at variable speed (phase-cutting)	√	√	√	√
CREFB	Device for consumption reduction of the external section ECOBREEZE fans	O	O	O	O
CHW2	Two-rows hot water coil	O	O	O	O
3WVM	Modulating 3-way valve	O	O	O	O
2WVM	Modulating 2-way valve	O	O	O	O
EH	Electric heaters.	O	O	O	O
GC	Modulating condensation gas heating module	O	O	O	O
CHWER	Energy recovery from food refrigeration	O	O	O	O
AMRX	Rubber antivibration mounts	◊	◊	◊	◊
RCX	Roof curb	◊	◊	◊	◊
PCM0	Sandwich panels of the handling zone in M0 fire reaction class	O	O	O	O
	Refrigeration circuit				
EVE	Electronic expansion valve	√	√	√	√
MHP	High and low pressure gauges	O	O	O	O
CPHG	Hot gas re-heating coil	O	O	O	O
	Aeraulic circuit				
M0	Horizontal air supply	√	√	√	√
M3	Downward air supply	O	O	O	O
M5	Upflow air supply	O	O	O	O
RO	Horizontal air return	√	√	√	√
R3	Downward air return	O	O	O	O
PCOSM	Constant supply airflow	O	O	O	O
PVAR	Variable airflow	O	O	O	O
FPG4	Pleated air filter class G4 (ISO 16890 Coarse 60%)	√	√	√	√
F7	High efficiency F7 air filter F7 (ISO 16890 ePM1 55%)	O	O	O	O
FES	Electronic filters (ISO 16890 ePM1 90%)	O	O	O	O
UVC	UV-C germicidal lamps	O	O	O	O
PSAF	Clogged filter differential pressure switch air side	O	O	O	O
HSE	Immersed electrodes steam humidifier	O	O	O	O
LTEMP1	Application for low outdoor temperature	O	O	O	O
VENH	High head fans	O	O	O	O
AXI	High efficiency diffuser for axial fan - AxiTop	√	√	√	√
PAQC	Air quality probe for CO2 rate check	-	O	O	O
PAQCV	Air quality sensor for CO2 and VOC rate check	-	O	O	O
SER	Outdoor air damper manually set	-	√	-	-
SERM	Outdoor air motorized on/off damper	-	O	-	-
SFCM	Modulating motorized FREE-COOLING damper	-	O	√	√
SFCEM	Modulating motorized FREE-COOLING damper and min. outdoor air motorized on/off damper	-	-	O	O
	Electric circuit				
CRC	Remote control with user interface	√	√	√	√
NCRC	Remote control with user interface: not required	O	O	O	O
SIX	Service interface	◊	◊	◊	◊
MOB	Serial port RS485 with Modbus protocol	O	O	O	O
LON	RS485 serial port with LONWORKS protocol	O	O	O	O
BACIP	BACnet-IP communication module	O	O	O	O
CLMX	Clivet Master System	◊	◊	◊	◊
DESM	Smoke detector	O	O	O	O
PM	Phase monitor	√	√	√	√
MF2	Multi-function phase monitor	O	O	O	O
PFCC	Power factor correction capacitors (cosfi > 0.95)	O	O	O	O
SFSTC	Progressive compressor start-up device	O	O	O	O
	Various				
PTCO	Set up for shipping via container	O	O	O	O

√ Standard componen
O Optional component

◊ The accessory can be separately supplied (optional
- Not available

Accessories

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.

PSAF

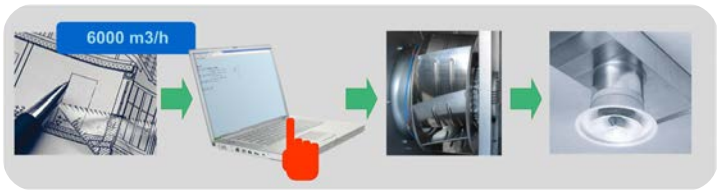
Clogged filter differential pressure switch air side

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.

PCOSM

Constant supply airflow

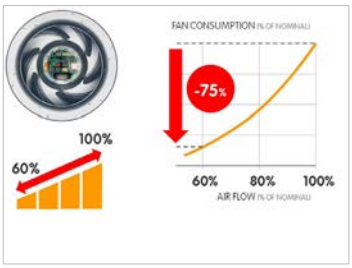
The original technology used eliminates the need for on-site calibration of traditional fans, as well as the time that would be required and the associated costs. The required flow rate is set on the display and maintained automatically by the unit, which controls the speed of the ventilating sections.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



PVAR

Variable airflow

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



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

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

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).

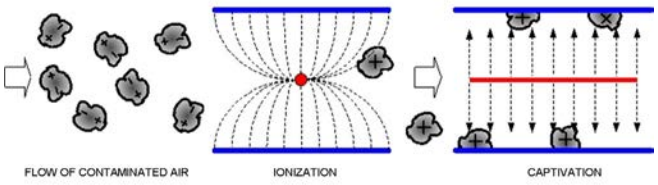
FES

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. Unit is provided with aluminium fan impeller.

Accessories

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.

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

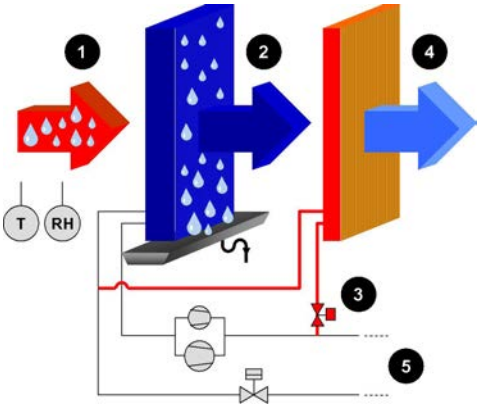
The option is recommended in areas with tobacco smoke, formaldehyde (from solvents, deodorants, glues, paints, detergents, food preparation, etc. The probe measures the rate of CO_2 and VOC (volatile organic compounds) in the environment and initiates a 0/10V proportional signal. Based on the received 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
49.4	Qo (m³ h)		22000					26000					34000				
	Qo (l/s)		6111					7222					9444				
	Ta (°C)	10	45,9	49,5	54,8	58,4	63,9	51,2	55,2	61,2	65,3	71,4	59,2	63,8	70,8	75,5	82,6
		12	42,3	45,8	51,2	54,8	60,2	47,2	51,2	57,1	61,1	67,2	54,5	59,1	66,1	70,8	77,8
		14	38,7	42,2	47,5	51,1	56,5	43,2	47,1	53,0	57,1	63,1	49,9	54,5	61,3	66,0	73,0
		16	35,2	38,7	44,0	47,5	52,9	39,2	43,1	49,0	53,0	59,0	45,2	49,8	56,7	61,3	68,3
		18	31,6	35,1	40,4	43,9	49,3	35,2	39,2	45,0	49,0	55,0	40,7	45,2	52,0	56,6	63,6
		20	28,1	31,6	36,8	40,3	45,7	31,3	35,2	41,1	45,0	50,9	36,1	40,6	47,4	52,0	58,9
54.4	Qo (m³ h)																
	Qo (l/s)																
	Ta (°C)	10	46,4	50,0	55,4	59,0	64,6	54,6	58,8	65,2	69,6	76,1	59,8	64,5	71,5	76,3	83,5
		12	42,7	46,3	51,7	55,3	60,8	50,3	54,5	60,9	65,2	71,7	55,1	59,7	66,7	71,5	78,6
		14	39,1	42,7	48,0	51,6	57,1	46,0	50,2	56,5	60,8	67,3	50,4	55,0	62,0	66,7	73,8
		16	35,5	39,1	44,4	48,0	53,4	41,7	45,9	52,2	56,5	62,9	45,7	50,3	57,2	61,9	69,0
		18	32,0	35,5	40,8	44,3	49,8	37,5	41,7	48,0	52,2	58,6	41,1	45,7	52,5	57,2	64,2
		20	28,4	31,9	37,2	40,7	46,1	33,4	37,5	43,8	47,9	54,3	36,5	41,1	47,9	52,5	59,5
60.4	Qo (m³ h)																
	Qo (l/s)																
	Ta (°C)	10	61,7	66,4	73,5	78,4	85,7	67,3	72,5	80,3	85,6	93,6	81,8	88,1	97,7	104,2	113,9
		12	56,8	61,6	68,7	73,5	80,8	62,0	67,2	75,0	80,2	88,2	75,4	81,7	91,2	97,6	107,4
		14	52,1	56,8	63,9	68,6	75,9	56,8	62,0	69,7	74,9	82,8	69,0	75,3	84,7	91,2	100,8
		16	47,4	52,0	59,1	63,8	71,0	51,7	56,8	64,5	69,7	77,5	62,7	69,0	78,3	84,7	94,3
		18	42,7	47,3	54,3	59,0	66,2	46,5	51,6	59,3	64,4	72,2	56,4	62,6	72,0	78,3	87,9
		20	38,0	42,6	49,6	54,3	61,4	41,4	46,5	54,1	59,2	67,0	50,2	56,4	65,7	72,0	81,5
70.4	Qo (m³ h)																
	Qo (l/s)																
	Ta (°C)	10	62,3	67,1	74,3	79,2	86,6	72,0	77,5	85,9	91,6	100,2	82,6	89,0	98,7	105,2	115,1
		12	57,4	62,2	69,4	74,2	81,6	66,4	71,9	80,2	85,9	94,4	76,1	82,5	92,1	98,6	108,4
		14	52,6	57,4	64,5	69,3	76,6	60,8	66,3	74,6	80,2	88,7	69,7	76,1	85,6	92,1	101,8
		16	47,8	52,6	59,7	64,5	71,7	55,2	60,7	68,9	74,5	83,0	63,3	69,7	79,1	85,6	95,3
		18	43,1	47,8	54,9	59,6	66,8	49,7	55,2	63,4	68,9	77,3	57,0	63,3	72,7	79,1	88,8
		20	38,4	43,1	50,1	54,8	62,0	44,3	49,7	57,9	63,4	71,7	50,7	57,0	66,4	72,7	82,3
80.4	Qo (m³ h)																
	Qo (l/s)																
	Ta (°C)	10	62,9	67,8	75,0	80,0	87,4	79,6	85,7	95,0	101,3	110,8	83,4	89,9	99,7	106,3	116,2
		12	58,0	62,8	70,1	75,0	82,4	73,3	79,5	88,7	95,0	104,4	76,9	83,3	93,0	99,6	109,5
		14	53,1	57,9	65,1	70,0	77,4	67,1	73,3	82,4	88,7	98,1	70,4	76,8	86,5	93,0	102,9
		16	48,3	53,1	60,3	65,1	72,4	61,0	67,1	76,2	82,4	91,8	63,9	70,3	79,9	86,4	96,2
		18	43,5	48,3	55,4	60,2	67,5	54,9	61,0	70,0	76,2	85,5	57,6	63,9	73,4	79,9	89,7
		20	38,8	43,5	50,6	55,4	62,6	48,9	54,9	64,0	70,0	79,3	51,2	57,5	67,1	73,4	83,1
90.4	Qo (m³ h)																
	Qo (l/s)																
	Ta (°C)	10	80,5	86,6	95,9	102,2	111,7	96,1	103,6	114,7	122,3	133,7	105,0	113,1	125,3	133,6	146,1
		12	74,2	80,4	89,6	95,9	105,3	88,7	96,1	107,2	114,7	126,1	96,8	104,9	117,0	125,3	137,7
		14	68,0	74,2	83,3	89,6	99,0	81,3	88,6	99,7	107,2	118,4	88,7	96,8	108,8	117,0	129,4
		16	61,9	68,0	77,1	83,3	92,7	73,9	81,2	92,2	99,6	110,9	80,6	88,7	100,7	108,8	121,1
		18	55,8	61,9	71,0	77,1	86,4	66,6	73,9	84,8	92,2	103,4	72,6	80,6	92,5	100,7	112,9
		20	49,8	55,8	64,8	70,9	80,2	59,3	66,6	77,5	84,8	95,9	64,7	72,6	84,5	92,6	104,7

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
100.4	Qo (m³ h)																
	Qo (l/s)																
	Ta (°C)	10	80,9	87,0	96,4	102,7	112,3	100,9	108,8	120,5	128,5	140,4	105,5	113,7	126,0	134,3	146,8
		12	74,6	80,8	90,1	96,4	105,8	93,1	100,8	112,5	120,5	132,4	97,3	105,4	117,6	125,9	138,4
		14	68,4	74,5	83,8	90,0	99,5	85,3	93,1	104,6	112,5	124,4	89,1	97,3	109,4	117,6	130,0
		16	62,2	68,3	77,5	83,7	93,1	77,6	85,3	96,8	104,6	116,4	81,0	89,1	101,2	109,4	121,7
		18	56,1	62,2	71,3	77,5	86,8	69,9	77,5	89,0	96,8	108,5	73,0	81,0	93,0	101,2	113,5
		20	50,0	56,0	65,2	71,3	80,6	62,2	69,8	81,2	89,0	100,7	65,0	73,0	84,9	93,0	105,2
110.4	Qo (m³ h)		22000					26000					34000				
	Qo (l/s)		6111					7222					9444				
	Ta (°C)	10	81,3	87,5	96,9	103,3	112,8	101,4	109,3	121,1	129,1	141,1	106,1	114,2	126,6	135,0	147,6
		12	75,0	81,2	90,5	96,8	106,4	93,6	101,4	113,1	121,1	133,1	97,8	105,9	118,2	126,6	139,1
		14	68,7	74,9	84,2	90,5	100,0	85,7	93,5	105,2	113,1	125,0	89,6	97,7	109,9	118,2	130,7
		16	62,5	68,7	77,9	84,1	93,6	78,0	85,7	97,3	105,2	117,0	81,4	89,5	101,7	109,9	122,3
		18	56,4	62,5	71,7	77,9	87,3	70,2	77,9	89,4	97,3	109,1	73,4	81,4	93,5	101,7	114,0
		20	50,3	56,3	65,5	71,6	81,0	62,6	70,2	81,6	89,4	101,2	65,3	73,3	85,3	93,5	105,8

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

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.

CHW2 **Two-rows hot water coil**

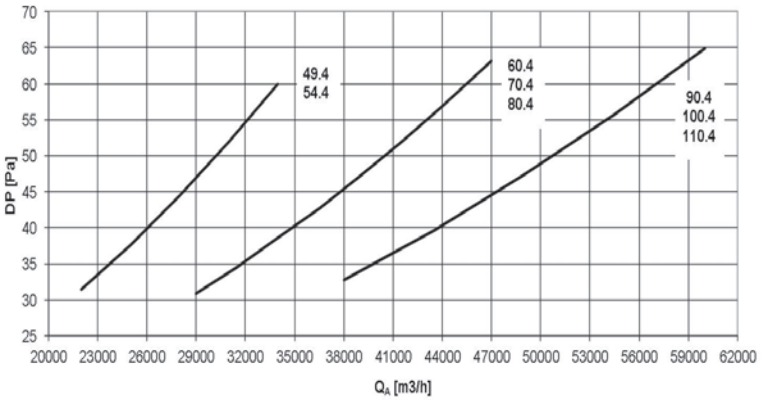
Option indicated for very cold climates, as it allows to heat up the area served. The exchanger comes with a thermostat for the antifreeze function, which is always active even when the unit is in stand-by, as long as it is operated electrically. If required, force the opening of the valve to the maximum 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).

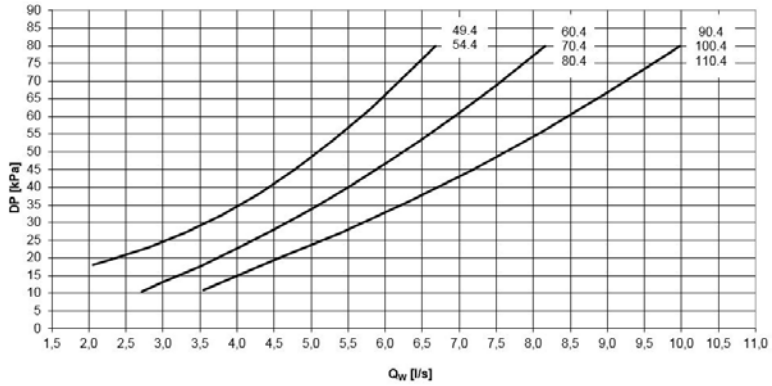
Hot water coil pressure drops: AIR side



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.

CHW2

Performances of hot water coil (two-row)

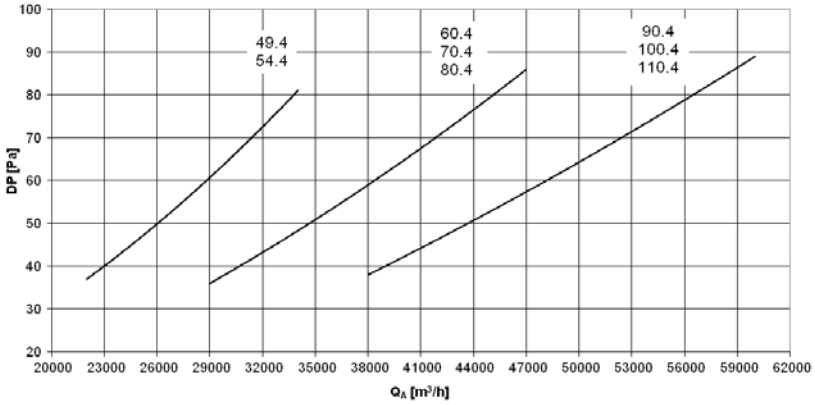
			Ti/To (°C)											
			80 / 65	70 / 55	70 / 60	60 / 40	80 / 65	70 / 55	70 / 60	60 / 40	80 / 65	70 / 55	70 / 60	60 / 40
			kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt
	Qo (m³/h)		22000				28000				34000			
	Qo (l/s)		6111				7777				9444			
49.4 54.4	TM (°C)	-10	195,9	240,1	253,2	283,9	229,5	281,4	297,3	333,2	259,5	318,5	337,0	377,5
		-5	173,6	217,5	230,4	261,1	203,2	254,9	270,7	306,3	229,8	288,6	306,9	347,0
		0	155,7	199,5	212,5	243,0	182,3	233,9	249,6	285,1	205,9	264,7	283,0	323,0
		5	147,0	190,5	203,5	234,0	172,0	223,4	239,1	274,5	194,3	252,9	271,1	311,0
		10	138,1	181,7	194,6	225,0	161,6	213,0	228,7	264,0	182,6	241,1	259,3	299,2
		15	129,4	172,9	185,7	216,1	151,2	202,6	218,3	253,6	170,9	229,3	247,5	287,3
	Qo (m³/h)		29000				38000				47000			
	Qo (l/s)		8055				10555				13055			
60.4 70.4 80.4	TM (°C)	-10	257,9	312,8	330,4	370,3	307,6	373,4	395,4	442,5	351,7	427,2	453,1	506,7
		-5	228,4	283,0	300,7	340,4	272,5	338,0	359,9	406,9	311,5	386,8	412,5	465,9
		0	205,1	259,7	277,0	316,7	244,4	310,0	331,7	378,6	279,6	354,7	380,3	433,6
		5	193,5	247,8	265,3	304,9	230,7	295,9	317,5	364,5	263,6	338,7	364,0	417,5
		10	182,0	236,4	253,8	293,2	216,8	282,1	303,7	350,5	247,6	322,8	348,1	401,4
		15	170,4	224,8	242,2	281,4	202,9	268,3	289,9	336,6	231,9	306,7	332,3	385,5
	Qo (m³/h)		38000				49000				60000			
	Qo (l/s)		10555				13611				16666			
90.4 100.4 110.4	TM (°C)	-10	337,3	412,6	434,6	487,8	398,0	487,4	514,4	576,9	452,2	554,3	585,8	656,5
		-5	298,9	373,9	395,6	448,6	352,7	441,7	468,5	530,6	400,6	502,4	533,6	603,9
		0	268,4	343,2	364,8	417,3	316,6	405,5	432,1	493,6	359,6	461,1	492,2	561,8
		5	253,3	327,9	349,6	402,0	298,5	387,4	414,0	475,4	339,2	440,6	471,6	541,2
		10	238,2	312,7	334,3	386,7	280,7	369,5	396,0	457,4	318,8	420,1	451,1	520,6
		15	223,1	297,6	319,2	371,4	262,9	351,5	378,0	439,3	298,3	399,7	430,7	500,1

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

CHWER **Energy recovery from food refrigeration**

This option makes it possible, during the winter season, to recover the heating energy produced by food storage in supermarkets, hypermarkets or food factories. It is a technical solution that recovers a significant heating resource, which is otherwise normally released outdoors.
The unit logic assigns a priority value to this function based on the heating availability of the resource, and integrates the overall output of the unit.
The option is comprised of a water exchanger, which is automatically controlled by a dedicated valve. With electrically powered units, the frost function is enabled, which forces the valve open when required.

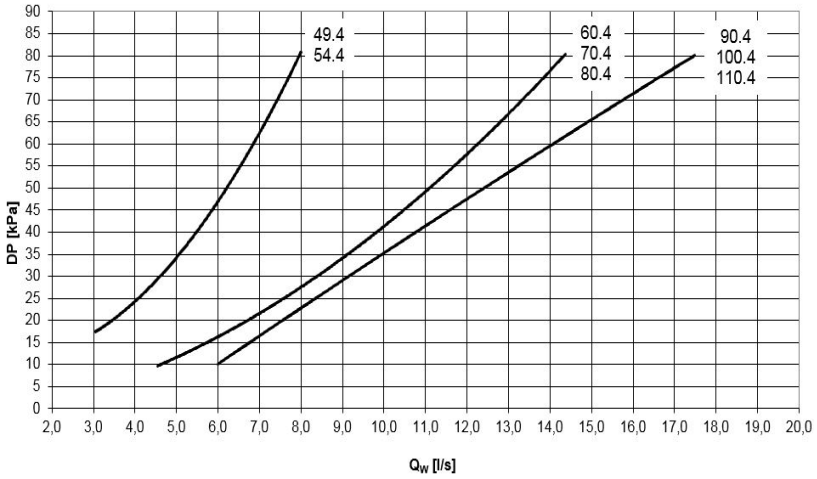
Hot water coil pressure drops: AIR side



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

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

Hot water coil pressure drops: WATER side



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

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

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

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

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

⚠ The component requires connection to the hot water plumbing system (to be provided for by the Client).
⚠ 'Electric elements', '2-row hot water coil', 'Combustion heating module' and 'Energy recovery from food refrigeration' cannot be assembled simultaneously.

CHWER — Performances of water heating coil from food refrigeration

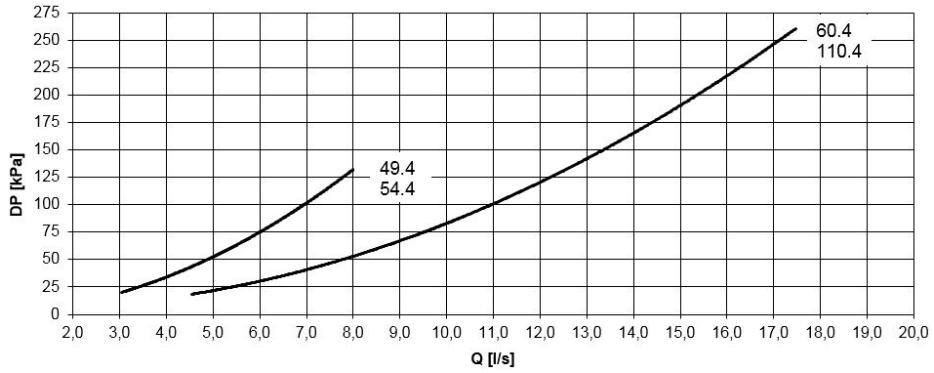
			Ti/To (°C)								
			45 / 40	40 / 35	35 / 30	45 / 40	40 / 35	35 / 30	45 / 40	40 / 35	35 / 30
			kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt
49.4 54.4	Qo (m³/h)			22000			28000			34000	
	Qo (l/s)			6111			7777			9444	
	TM (°C)	5	200,8	173,6	146,3	239,2	206,6	174,0	274,1	236,6	199,1
		10	172,6	145,5	118,4	205,5	173,1	140,7	235,5	198,4	161,0
		14	150,2	123,4	96,3	178,9	146,7	114,4	205,0	168,0	130,8
		16	139,3	112,4	85,4	165,8	133,6	101,4	190,0	153,0	115,8
		18	128,2	101,4	74,6	152,7	120,6	88,4	174,9	138,0	101,0
		20	117,3	90,6	63,7	139,6	107,6	75,5	159,9	123,1	86,1
60.4 70.4 80.4	Qo (m³/h)			29000			38000			47000	
	Qo (l/s)			8055			10555			13055	
	TM (°C)	5	265,1	228,9	192,5	322,3	278,2	233,7	373,9	322,5	270,7
		10	227,5	191,6	155,6	276,7	232,8	188,7	321,2	269,9	218,5
		14	198,0	162,2	126,5	240,8	197,0	153,2	279,3	228,3	177,3
		16	183,3	147,7	112,0	222,9	179,2	135,6	258,6	207,7	156,8
		18	168,8	133,2	97,6	205,2	161,7	118,1	237,9	187,1	136,4
		20	154,3	118,9	83,3	187,5	144,1	100,6	217,4	166,8	116,0
90.4 100.4 110.4	Qo (m³/h)			38000			49000			60000	
	Qo (l/s)			10555			13611			16666	
	TM (°C)	5	348,3	301,1	253,7	418,8	361,7	304,5	482,6	416,5	350,6
		10	299,3	252,4	205,4	359,8	303,2	246,4	414,7	349,3	283,5
		14	260,6	214,0	167,2	313,3	257,0	200,5	361,0	295,9	230,5
		16	241,5	195,0	148,3	290,2	234,1	177,6	334,6	269,4	204,2
		18	222,5	176,0	129,5	267,4	211,2	155,0	308,1	243,1	177,9
		20	203,5	157,2	110,7	244,5	188,5	132,3	281,7	216,9	151,8

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

3WVM — Modulating 3-way valve for energy recovery from food refrigeration

To be combined with water coil for the energy recovery from food refrigeration. 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 "CHWER - Energy recovery from food refrigeration" option.

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

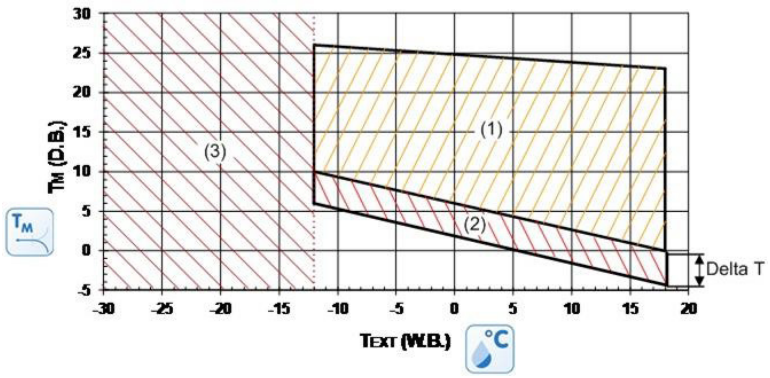
SIZE	49.4	54.4	60.4	70.4	80.4	90.4	100.4	110.4
24 kW	√	√	√	√	√	√	√	√
36 kW	√	√	√	√	√	√	√	√
48 kW	√	√	√	√	√	√	√	√

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

Operation field extension with electric heaters DT (°C)

SIZE	Air flow [m³/h]	24 kW	36 kW	48 kW
49.4	26000	2,7	4,1	5,5
54.4	29000	2,5	3,7	4,9
60.4	33000	2,2	3,2	4,3
70.4	37000	1,9	2,9	3,8
80.4	44000	1,6	2,4	3,2
90.4	52000	1,4	2,1	2,7
100.4	56000	1,3	1,9	2,5
110.4	60000	1,2	1,8	2,4

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.

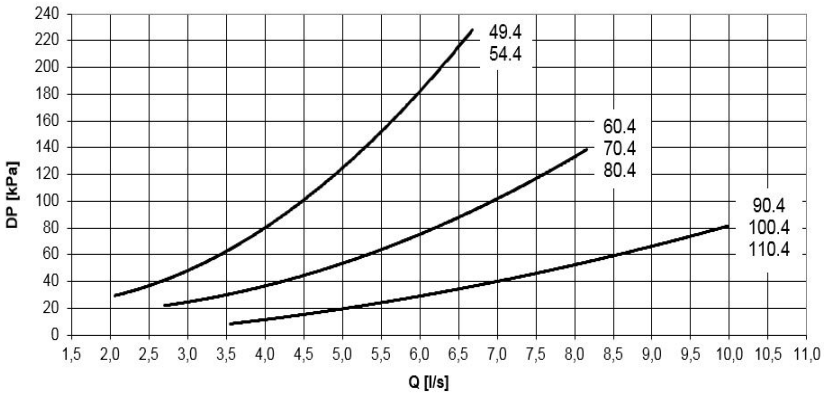
With fresh air temperature within -10°C and -30 °C, the following options will be required: hot water coil and outdoor low temperature set-up.

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

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

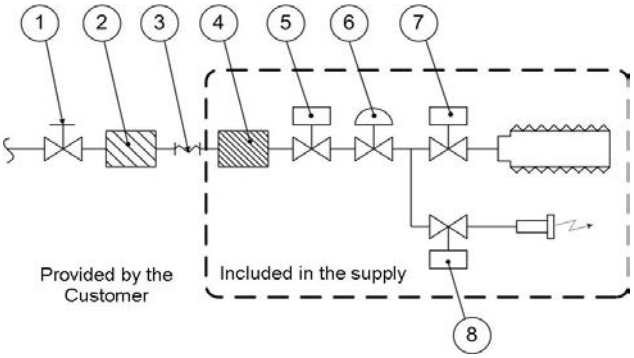
GC

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

		65KW		82KW		100KW		130KW		164KW		200KW		300KW	
Description		min	max	min	max	min	max	min	max	min	max	min	max	min	max
Rated thermal input	kW	12,4	65,0	16,4	82,0	21,0	100,0	12,4	130,0	16,4	164,0	21,0	200,0	21,0	300,0
Efficiency Hi (P.C.I.)	%	108,1	96,8	108,4	97,6	108,6	97,2	108,1	96,8	108,4	97,6	108,6	97,2	108,6	97,2
Efficiency Hu (P.C.S.)	%	97,4	87,2	97,6	87,9	97,8	87,5	97,4	87,2	97,6	87,9	97,8	87,5	97,8	87,5
Max condensation produced	l/h	2,1		3,3		2,7		4,2		6,6		5,4		8,1	
Carbon monoxide CO (0% di O_2)	ppm	<5		<5		<5		<5		<5		<5		<5	
Nitrogen oxides - NOx (0% di O_2)		39 mg / kWh 22 ppm		41 mg / kWh 23 ppm		39 mg / kWh 22 ppm		39 mg / kWh 23 ppm		41 mg / kWh 23 ppm		39 mg / kWh 22 ppm		39 mg / kWh 22 ppm	
Available flue pressure	Pa	120		120		120		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 1 1/2"		UNI ISO 228/1 - G 1 1/2"		UNI ISO 228/1 - G 1 1/2"		UNI ISO 228/1 - 1xG 1 1/2" and 1xG 3/4"	
Exhaust pipe diameter	mm	80		80		80		2 x 80		2 x 80		2 x 80		3 x 80	
Seasonal space heating energy efficiency [EU Reg./2281/2016] [ηs, h]	%	93,2		93,2		93,1		93,9		94		94		94,2	
Emission efficiency [EU Reg./2281/2016] [ηsflow]	%	97,4		97,1		97,0		98,1		97,9		97,9		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	1,31	6,88	1,74	8,68	2,22	10,58	2,62	13,76	3,48	17,36	4,44	21,16	6,66	31,74

Matchning of the condensing gas heating module

	POWER	49.4	54.4	60.4	70.4	80.4	90.4	100.4	110.4
GC09X	65 kW	√	√	X	X	X	X	X	X
GC10X	82 kW	√	√	√	√	√	X	X	X
GC11X	100 kW	√	√	√	√	√	X	X	X
GC12X	130 kW	√	√	X	X	X	√	√	√
GC13X	164 kW	X	X	√	√	√	√	√	√
GC06X	200 kW	X	X	√	√	√	√	√	√
GC07X	300 kW	X	X	X	X	X	√	√	√

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

- The component requires gas supply (gas connections to be made by the Customer). The location of the unit and the fume drain mode must comply with laws and standards in force in the Country of use.
- The assembly of the chimney kit must be performed on site by the Customer. According to specific requirements of installation, the chimney length can be increased by means of appropriate joints and fittings (not supplied by Clivet).
- Electric elements', '2-row hot water coil', 'Combustion heating module' and 'Energy recovery from food refrigeration' cannot be assembled simultaneously.

LTEMP1

Application for low outdoor temperature

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

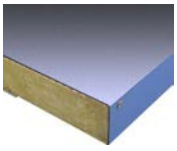
A. The option includes self-regulating heaters with thermostats that can protect the electrical panel from freezing to make sure it operates correctly.
B. The special version of the outdoor air damper for the application for low outdoor temperature is made of anti-seize devices that facilitate the correct 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

- 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.



MOB

RS485 Serial port with Modbus protocol

It allows the serial connection to supervision systems, using Modbus as the communication protocol. It allows the access to the complete list of operating variables, controls and alarms.
The device is installed and wired built-in the unit.

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

LON

LON - RS485 Serial port with LonWorks protocol

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

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

BACIP

BACnet-IP serial communication module

Allows to perform the connection to supervision systems by using BACnet-IP as a communication protocol. It allows to access the entire list of operating variables, controls and alarms.
The device is installed and wired built-in the unit.

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

NCRC

Remote control with user interface: not required

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

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

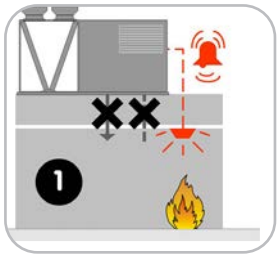
DESM

Smoke detector

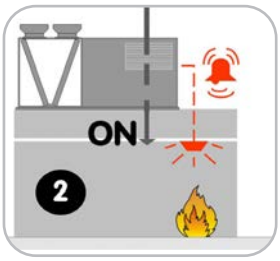
This option allows detection of smoke in the room by analyzing the return air. The Tyndal-effect increased sensitivity smoke detector is perfect for ventilation ducts since it is able to detect rarefied smoke in high-speed air flows. Smoke detection occurs using a photo-optical system with a labyrinth 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

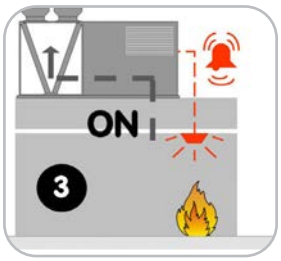
COMPLETE UNIT SHUTDOWN



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.

MF2

Multifunction phase monitor

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

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

Accessories

PFCC

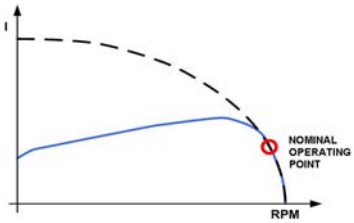
Power factor correction capacitors (cosfi > 0.95)

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.

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

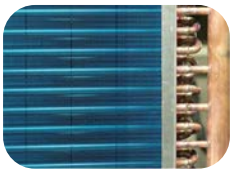
Set up for shipping via container

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 coating for all the coils of the refrigerant circuit (Treatment, Source, Hot gas post-heating - CPHG, THOR energy recovery).
⚠ Water coil treatment (CHW2 and CHWER) 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.

SIX

Service interface

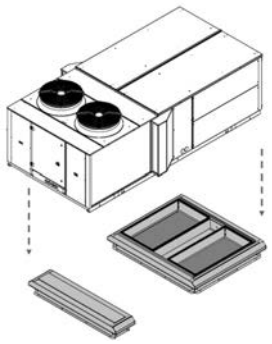
The device allows to fully control the unit for start-up and maintenance operations conducted by authorised technical personnel. It must be connected on the outside of the unit via the RJ45 connector and the 1.5m connection cable that can be further extended. The device can be easily applied on the unit's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

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

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 Customer.

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.

AMRX

Rubber antivibration mounts

The rubber antivibration mounts must be fixed to designated housings on the support stringers and are used to dampen vibrations produced by the unit, thereby reducing the noise transmitted to the support structures. They are flexible bodies able to dampen axial and tangential stresses and maintain the mechanical properties almost constant over time thanks to high resistance materials of which they are made.
Alternatively, rubberized neoprene anti-vibration strips may be used on the unit longitudinal support members (not supplied by Clivet).

Prerformance

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

Size 49.4 Configuration CCKP

Cooling performance with 30% of outdoor and exhaust air

AIRFLOW	Ta [°C] DB/ WB	OUTDOOR AIR TEMPERATURE °C D.B/W.B.																							
		20 / 12				25 / 18				30 / 22				35 / 24				40 / 25				45 / 26			
		kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER
22000 m³/h	22 / 16	150,9	112,9	28,5	5,29	166,3	116,0	32,1	5,18	166	112,3	36,0	4,61	160,4	112,9	40,0	4,01	152,3	115,4	44,6	3,41	152,7	117,3	49,7	3,07
	24 / 17	154,2	116,6	28,7	5,37	168,6	119,6	32,3	5,22	168,9	116,2	36,2	4,67	163,3	117,3	40,2	4,06	154,4	119,5	44,8	3,45	155,6	123,6	51,3	3,03
	26 / 18	157,2	120,3	28,9	5,44	166,0	119,9	32,5	5,11	171,7	120,1	36,5	4,70	165,9	121,2	40,4	4,11	156,8	123,2	45,0	3,48	162,2	129,1	52,6	3,08
	27 / 19	160,8	119,7	29,1	5,53	166,4	117,8	32,7	5,09	171,8	118,2	36,7	4,68	168,7	121,2	40,7	4,14	160	122,7	45,3	3,53	167,4	130,0	53,3	3,14
	28 / 20	164,5	119,1	29,3	5,61	166,8	115,7	32,9	5,07	172,0	116,2	36,9	4,66	171,5	121,1	40,9	4,19	163,5	122,2	45,6	3,59	172,9	130,8	54,1	3,20
	30 / 22	172,1	117,6	29,7	5,79	174,0	113,9	33,4	5,21	172,4	112,1	37,4	4,61	178,1	119,7	41,4	4,30	170,6	120,9	46,1	3,70	-	-	-	-
26000 m³/h	22 / 16	157,1	119,5	28,9	5,44	171,9	123,6	32,5	5,29	171,3	119,5	36,4	4,71	166,1	119,7	40,3	4,12	158,3	121,6	45,1	3,51	153,2	126,8	50,0	3,06
	24 / 17	160,6	123,6	29,1	5,52	174,5	127,4	32,7	5,34	174,2	124,1	36,6	4,76	169,3	124,5	40,6	4,17	160,1	126,7	45,3	3,53	159,6	133,7	51,4	3,11
	26 / 18	163,9	127,8	29,3	5,59	172,4	127,5	32,9	5,24	176,8	128,8	36,9	4,79	172,0	129,0	40,8	4,22	161,7	132	45,5	3,55	168,2	139,4	52,8	3,19
	27 / 19	167,7	127,2	29,4	5,70	173,0	125,0	33,1	5,23	177,1	126,5	37,1	4,77	174,9	128,7	41,1	4,26	165,1	131,5	45,8	3,60	173,8	140,3	53,5	3,25
	28 / 20	171,5	126,5	29,6	5,79	173,8	122,5	33,3	5,22	177,4	124,2	37,3	4,76	177,9	128,3	41,4	4,30	168,6	130,9	46,1	3,66	179,5	141,1	54,2	3,31
	30 / 22	179,3	125,0	30,0	5,98	180,9	120,6	33,8	5,35	178,0	119,5	37,8	4,71	184,5	126,9	41,9	4,40	175,8	129,6	46,8	3,76	-	-	-	-
34000 m³/h	22 / 16	165,5	132,8	29,3	5,65	181,7	134,9	33,1	5,49	180,3	131,2	36,9	4,89	173,9	132,0	40,9	4,25	164,7	136,3	45,7	3,60	162,7	142,3	50,7	3,21
	24 / 17	169,4	137,3	29,5	5,74	184,1	140,2	33,3	5,53	183,3	136,7	37,2	4,93	177,0	138,1	41,2	4,30	167,4	141,3	46,0	3,64	169,7	151,7	52,4	3,24
	26 / 18	173,1	142,1	29,7	5,83	181,5	141,0	33,5	5,42	186,3	142,0	37,4	4,98	179,6	143,9	41,4	4,34	169,8	146,4	46,3	3,67	178,4	157,6	53,5	3,33
	27 / 19	177,0	141,2	29,9	5,92	181,9	138,3	33,7	5,40	186,4	139,5	37,7	4,94	182,6	143,7	41,7	4,38	173	146,3	46,6	3,71	183,8	158,7	54,0	3,40
	28 / 20	181,0	140,3	30,1	6,01	182,4	135,6	34,0	5,36	186,6	136,8	37,9	4,92	185,5	143,4	42,0	4,42	176,4	146,2	46,8	3,77	189,2	159,7	54,4	3,48
	30 / 22	189,0	138,5	30,5	6,20	189,9	133,5	34,4	5,52	187,1	131,4	38,5	4,86	192,1	142,0	42,5	4,52	183,4	145,8	47,4	3,87	-	-	-	-

Heating performance with 30% of outdoor and exhaust air

AIRFLOW	Ta [°C] DB	OUTDOOR AIR TEMPERATURE °C D.B/W.B.																		
		-7 / -8			-5 / -6			0 /-1			2 / 1			7 / 6			12 / 11		
		kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP
22000 m³/h	10	128.4	23.1	5,56	134,8	23,9	5,64	150,2	26,3	5,71	156,2	27,3	5,72	172,3	30,1	5,72	188,2	33,3	5,65
	15	128.7	25.0	5,15	134,7	25,8	5,22	152,2	28,2	5,40	159,3	29,4	5,42	174,4	32,5	5,37	190,0	36,0	5,28
	18	128.6	26.0	4,95	134,9	27,0	5,00	152,4	29,5	5,17	159,2	30,7	5,19	175,2	34,0	5,15	189,7	37,3	5,09
	20	129.2	26.9	4,80	135,6	27,8	4,88	152,6	30,4	5,02	159,2	31,6	5,04	174,4	34,8	5,01	188,8	38,0	4,97
	22	129.8	27.7	4,69	136,3	28,7	4,75	152,8	31,3	4,88	158,8	32,5	4,89	173,0	35,5	4,87	187,9	38,8	4,84
	25	130.7	29.0	4,51	137,1	30,0	4,57	152,1	32,6	4,67	157,6	33,8	4,66	170,9	36,6	4,67	186,7	40,1	4,66
26000 m³/h	10	128.3	22.1	5,81	134,5	22,8	5,90	150,1	25,0	6,00	156,4	25,9	6,04	173,1	28,3	6,12	190,1	31,1	6,11
	15	128.8	23.9	5,39	134,8	24,7	5,46	152,0	26,7	5,69	159,7	27,9	5,72	175,7	30,6	5,74	192,4	33,6	5,73
	18	129.0	25.0	5,16	135,1	25,9	5,22	152,8	28,1	5,44	160,0	29,2	5,48	176,9	32,0	5,53	192,5	34,9	5,52
	20	129.4	25.8	5,02	135,7	26,7	5,08	153,3	28,9	5,30	160,2	30,0	5,34	176,3	32,8	5,38	191,7	35,6	5,38
	22	129.9	26.6	4,88	136,2	27,5	4,95	153,8	29,8	5,16	160	30,9	5,18	175,0	33,4	5,24	191,0	36,4	5,25
	25	130.5	27.7	4,71	136,9	28,7	4,77	153,3	31,0	4,95	159,0	32,0	4,97	172,9	34,4	5,03	190,0	37,7	5,04
34000 m³/h	10	129.2	20.9	6,18	135,7	21,6	6,28	150,7	23,4	6,44	157,1	24,1	6,52	174,2	26,1	6,67	192,5	28,4	6,78
	15	129.4	22.6	5,73	135,5	23,3	5,82	152,9	25,0	6,12	160,6	25,9	6,20	177,3	28,3	6,27	195,4	30,8	6,34
	18	129.3	23.7	5,46	135,7	24,4	5,56	153,7	26,2	5,87	161	27,1	5,94	178,8	29,6	6,04	195,9	32,0	6,12
	20	129.8	24.4	5,32	136,3	25,1	5,43	154,2	27,0	5,71	161,3	28,0	5,76	178,4	30,3	5,89	195,5	32,7	5,98
	22	130.2	25.1	5,19	136,8	25,9	5,28	154,7	27,8	5,56	161,2	28,7	5,62	177,2	30,9	5,73	195,0	33,4	5,84
	25	130.9	26.2	5,00	137,4	27,0	5,09	154,3	28,9	5,34	160,3	29,8	5,38	175,4	31,9	5,50	194,3	34,5	5,63

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 54.4 Configuration CCKP

Cooling performance with 30% of outdoor and exhaust air

PORTATA ARIA	Ta [°C] DB/WB	TEMPERATURA ARIA ESTERNA °C D.B/W.B.																							
		20 / 12				25 / 18				30 / 22				35 / 24				40 / 25				45 / 26			
		kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER
22000 m³/h	22 / 16	157,2	118,1	30,8	5,10	173,5	120,7	34,9	4,97	171,6	117,8	39,2	4,38	167,4	116,4	43,6	3,84	160,3	116,7	48,8	3,28	160,8	124,5	56,1	2,87
	24 / 17	161,1	121,2	31,1	5,18	175,8	124,3	35,1	5,01	175,3	121,0	39,5	4,44	170,5	120,4	43,9	3,88	161,5	121,6	49,1	3,29	162,6	131,0	57,3	2,84
	26 / 18	164,9	124,3	31,3	5,27	172,8	124,8	35,2	4,91	178,9	124,2	39,7	4,51	173,5	124,1	44,1	3,93	162,0	127,1	49,4	3,28	165,7	133,2	57,1	2,90
	27 / 19	168,3	124,0	31,5	5,34	173,0	122,9	35,4	4,89	179	122,1	39,9	4,49	176,8	123,6	44,4	3,98	165,5	126,6	49,7	3,33	169,1	132,4	57,2	2,96
	28 / 20	171,8	123,7	31,7	5,42	173,3	120,9	35,6	4,87	179,1	119,9	40,2	4,46	180,1	123,1	44,6	4,04	169,4	125,8	50,0	3,39	172,6	131,5	57,2	3,02
	30 / 22	179,1	122,9	32,2	5,56	180,8	118,9	36,2	4,99	179,7	115,4	40,7	4,42	186,2	122,5	45,2	4,12	177,1	124,4	50,6	3,50	-	-	-	-
29000 m³/h	22 / 16	168,8	128,9	31,7	5,32	184,5	132,7	35,6	5,18	183,1	128	39,9	4,59	176,3	128,9	44,3	3,98	167,6	132,1	49,5	3,39	171,8	141,7	57,1	3,01
	24 / 17	172,7	133,1	31,9	5,41	187,1	137,1	35,8	5,23	185,7	133,8	40,1	4,63	180,2	133,1	44,7	4,03	170,5	135,9	49,9	3,42	175,8	145,0	57,6	3,05
	26 / 18	176,5	137,4	32,0	5,52	184,6	137,4	36,0	5,13	188,1	139,4	40,3	4,67	182,9	138,5	44,9	4,07	173,4	139,3	50,4	3,44	187,1	151,9	59,1	3,17
	27 / 19	180,1	137,1	32,2	5,59	185,1	134,8	36,2	5,11	188,6	136,6	40,6	4,65	185,9	138,6	45,1	4,12	176,7	139,2	50,7	3,49	195,3	154,1	60,1	3,25
	28 / 20	183,9	136,8	32,4	5,68	185,7	132,2	36,5	5,09	189,1	133,8	40,9	4,62	188,9	138,5	45,3	4,17	180,1	139,3	51,0	3,53	203,7	156,3	61,1	3,33
	30 / 22	191,6	135,7	32,8	5,84	193,4	130,1	37,0	5,23	190,3	128,0	41,4	4,60	195,7	137,1	45,9	4,26	187,1	139,3	51,5	3,63	-	-	-	-
34000 m³/h	22 / 16	174,5	136,6	31,9	5,47	191,2	139,3	35,9	5,33	188,7	135,5	40,3	4,68	180,9	137,4	44,6	4,06	172,1	140,5	49,9	3,45	177,5	150,6	56,9	3,12
	24 / 17	178,2	141,7	32,1	5,55	194,3	143,5	36,2	5,37	191,3	141,4	40,6	4,71	184,7	142,5	44,9	4,11	174,8	145,9	50,2	3,48	180,0	157,0	57,5	3,13
	26 / 18	181,9	146,7	32,3	5,63	190,9	145,1	36,4	5,24	194,2	146,9	40,8	4,76	188,6	146,6	45,3	4,16	177,2	151,0	50,4	3,52	192,0	164,6	59,2	3,24
	27 / 19	185,9	146,0	32,5	5,72	191,0	142,8	36,6	5,22	194,7	143,9	41,1	4,74	192,0	145,9	45,6	4,21	180,4	151,0	50,8	3,55	200,4	167,1	60,2	3,33
	28 / 20	190,0	145,1	32,8	5,79	191,2	140,6	36,8	5,20	195,2	140,9	41,3	4,73	195,5	145,1	45,9	4,26	183,8	150,9	51,3	3,58	209,1	169,6	61,2	3,42
	30 / 22	198,5	142,9	33,3	5,96	199,1	138,1	37,4	5,32	196,2	135,0	41,9	4,68	201,9	144,3	46,5	4,34	190,6	150,5	52,2	3,65	-	-	-	-

Heating performance with 30% of outdoor and exhaust air

PORTATA ARIA	Ta [°C] DB	TEMPERATURA ARIA ESTERNA °C.D.B/W.B.																		
		-7 / -8			-5 / -6			0 /-1			2 / 1			7 / 6			12 / 11		
		kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP
22000 m³/h	10	136.6	25.3	5,40	143,3	26,2	5,47	159,8	29	5,51	165,9	30,1	5,51	182,5	33,2	5,50	199,6	36,9	5,41
	15	136.8	27.3	5,01	143,1	28,2	5,07	162,1	31,1	5,21	169,3	32,5	5,21	184,8	36,0	5,13	201,2	40	5,03
	18	136.8	28.5	4,80	143,3	29,6	4,84	162,7	32,6	4,99	169,5	34,0	4,99	185,7	37,7	4,93	200,6	41,5	4,83
	20	137.3	29.5	4,65	144,0	30,6	4,71	163,1	33,6	4,85	169,6	35,0	4,85	184,7	38,6	4,78	199,3	42,3	4,71
	22	137.9	30.5	4,52	144,6	31,6	4,58	163,5	34,6	4,73	169,2	36,0	4,70	182,9	39,4	4,64	198,0	43,0	4,60
	25	138.7	31.9	4,35	145,5	33,2	4,38	162,7	36,2	4,49	167,7	37,5	4,47	180,3	40,6	4,44	196,6	44,6	4,41
29000 m³/h	10	136.6	23.5	5,81	143,1	24,3	5,89	159,9	26,6	6,01	166,6	27,5	6,06	184,5	30,0	6,15	202,9	33,0	6,15
	15	137.4	25.4	5,41	143,9	26,3	5,47	162,1	28,5	5,69	170,2	29,6	5,75	187,3	32,5	5,76	205,3	35,7	5,75
	18	137.8	26.6	5,18	144,5	27,5	5,25	162,9	29,9	5,45	170,6	31,0	5,50	188,6	34,0	5,55	205,5	37,1	5,54
	20	138.2	27.4	5,04	144,9	28,4	5,10	163,4	30,8	5,31	170,8	32,0	5,34	188,0	34,9	5,39	204,8	37,9	5,40
	22	138.6	28.3	4,90	145,4	29,2	4,98	164,0	31,7	5,17	170,7	32,9	5,19	186,6	35,7	5,23	204,1	38,7	5,27
	25	139.2	29.5	4,72	145,9	30,5	4,78	163,7	33,1	4,95	169,8	34,2	4,96	184,5	36,8	5,01	203,2	40,1	5,07
34000 m³/h	10	137.2	22.7	6,04	143,9	23,5	6,12	160,4	25,5	6,29	167,0	26,3	6,35	185,0	28,6	6,47	203,9	31,2	6,54
	15	137.8	24.6	5,60	144,4	25,4	5,69	162,7	27,2	5,98	170,7	28,3	6,03	188,2	31,0	6,07	207	33,8	6,12
	18	137.9	25.7	5,37	144,8	26,6	5,44	163,1	28,6	5,70	170,9	29,7	5,75	189,7	32,4	5,85	207,6	35,2	5,90
	20	138.5	26.5	5,23	145,4	27,4	5,31	163,4	29,5	5,54	171	30,6	5,59	189,3	33,2	5,70	207,2	35,9	5,77
	22	139.0	27.3	5,09	145,9	28,2	5,17	163,7	30,4	5,38	170,9	31,4	5,44	188,1	33,9	5,55	206,8	36,6	5,65
	25	139.8	28.5	4,91	146,6	29,5	4,97	163,6	31,7	5,16	170,2	32,6	5,22	186,3	34,9	5,34	206,1	38,0	5,42

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 60.4 Configuration CCKP

Cooling performance with 30% of outdoor and exhaust air

PORTATA ARIA	Ta [°C] DB/WB	TEMPERATURA ARIA ESTERNA °C D.B/W.B.																							
		20 / 12				25 / 18				30 / 22				35 / 24				40 / 25				45 / 26			
		kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER
29000 m³/h	22 / 16	190,1	142,8	34,8	5,46	209,4	147,0	39,3	5,33	210,1	141,0	44,2	4,75	202,6	142,7	48,8	4,15	193,3	143,3	54,5	3,55	190,0	154,0	61,6	3,08
	24 / 17	194,9	146,9	35,1	5,55	213,1	150,9	39,5	5,39	213,0	146,9	44,4	4,80	205,9	148,8	49,0	4,20	195,3	149,6	54,7	3,57	192,6	159,0	61,7	3,12
	26 / 18	199,3	151,0	35,3	5,65	209,3	152,0	39,7	5,27	215,8	152,9	44,7	4,83	209,1	154,3	49,3	4,24	197,1	156,2	54,8	3,60	197,8	162,5	62,4	3,17
	27 / 19	203,3	150,9	35,5	5,73	209,5	149,8	39,9	5,25	216,1	150,3	44,9	4,81	212,9	153,9	49,6	4,29	201,0	155,7	55,2	3,64	202,5	162,1	62,9	3,22
	28 / 20	207,6	150,6	35,7	5,82	209,7	147,6	40,2	5,22	216,4	147,8	45,2	4,79	216,8	153,4	49,9	4,34	205,2	154,9	55,6	3,69	207,4	161,6	63,5	3,27
	30 / 22	216,7	149,3	36,0	6,02	218,5	145,4	40,8	5,36	217,0	142,7	45,7	4,75	225,7	151,3	50,5	4,47	214,0	153,0	56,5	3,79	-	-	-	
33000 m³/h	22 / 16	197,1	148,8	35,1	5,62	215,2	153,9	39,8	5,41	216,0	147,3	44,6	4,84	208,9	148,6	49,2	4,25	197,1	152,3	54,9	3,59	197,7	161,3	62,4	3,17
	24 / 17	201,6	153,8	35,3	5,71	218,9	158,4	40,0	5,47	218,9	154,6	44,7	4,90	213,3	154,0	49,6	4,30	199,8	157,6	55,3	3,61	198,4	168,3	62,2	3,19
	26 / 18	206,4	158,4	35,6	5,80	216,2	158,5	40,3	5,36	222,5	160,7	44,9	4,96	216,7	160,1	49,8	4,35	201,9	163,0	55,8	3,62	203,4	172,8	62,7	3,24
	27 / 19	211	157,7	35,8	5,89	217,0	155,5	40,5	5,36	223	157,7	45,2	4,93	220,2	160,2	50,1	4,40	205,8	162,9	56,2	3,66	208	172,7	63,2	3,29
	28 / 20	215,7	156,8	36,0	5,99	217,8	152,4	40,8	5,34	223,6	154,7	45,5	4,91	223,7	160,2	50,4	4,44	210	162,7	56,5	3,72	212,7	172,6	63,7	3,34
	30 / 22	225,6	154,8	36,5	6,18	226,2	151,0	41,4	5,46	225,0	148,3	46,0	4,89	231,4	159,5	51,0	4,54	218,5	162,3	57,1	3,83	-	-	-	
47000 m³/h	22 / 16	212,5	168,9	35,9	5,92	231,1	175,5	40,5	5,71	228,7	170,9	45,4	5,04	222,3	170,1	50,1	4,44	207,3	178,5	55,9	3,71	202,8	188,6	62,6	3,24
	24 / 17	216,9	176,2	36,1	6,01	234,6	181,8	40,8	5,75	233,5	177,1	45,7	5,11	226,1	178,9	50,4	4,49	209,9	185,6	56,5	3,72	199	195,3	62,3	3,19
	26 / 18	221,5	182,9	36,3	6,10	231,7	182,2	41,1	5,64	238,6	182,9	46,0	5,19	229,9	186,1	50,7	4,53	212,3	192,3	57,0	3,72	204,3	199,1	62,5	3,27
	27 / 19	226,3	182,0	36,5	6,20	232,5	178,6	41,4	5,62	238,6	179,7	46,3	5,15	233,8	185,7	51,0	4,58	216,6	192,0	57,3	3,78	207,6	199,0	62,6	3,32
	28 / 20	231,1	181,1	36,7	6,30	233,3	174,9	41,7	5,59	238,7	176,5	46,6	5,12	237,7	185,2	51,3	4,63	221,2	191,8	57,6	3,84	210,8	198,7	62,8	3,36
	30 / 22	241,0	178,7	37,3	6,46	242,0	173,3	42,2	5,73	239,0	170,0	47,2	5,06	245,9	183,9	51,9	4,74	230,6	191,0	58,2	3,96	-	-	-	

Heating performance with 30% of outdoor and exhaust air

PORTATA ARIA	Ta [°C] DB	TEMPERATURA ARIA ESTERNA °C.D.B/W.B.																		
		-7 / -8			-5 / -6			0 /-1			2 / 1			7 / 6			12 / 11		
		kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP
29000 m³/h	10	159.5	27.8	5,74	167,8	28,8	5,83	186,3	31,6	5,90	193,7	33,0	5,87	213,9	36,5	5,86	234,0	40,2	5,82
	15	159.7	30.0	5,32	167,3	31,1	5,38	189,0	33,8	5,59	197,7	35,5	5,57	216,5	39,4	5,49	235,7	43,5	5,42
	18	159.6	31.4	5,08	167,5	32,6	5,14	189,4	35,5	5,34	197,6	37,1	5,33	217,4	41,1	5,29	235,2	45,1	5,22
	20	160.2	32.4	4,94	168,3	33,7	4,99	189,6	36,6	5,18	197,6	38,1	5,19	216,4	42,1	5,14	233,9	45,9	5,10
	22	160.9	33.4	4,82	169,0	34,8	4,86	189,9	37,6	5,05	197,1	39,2	5,03	214,4	42,9	5,00	232,6	46,7	4,98
	25	162.0	34.9	4,64	169,9	36,4	4,67	188,9	39,4	4,79	195,5	40,7	4,80	211,6	44,1	4,80	230,8	48,3	4,78
33000 m³/h	10	159.4	26.9	5,93	167,4	27,8	6,02	186,5	30,5	6,11	194,5	31,6	6,16	214,9	34,7	6,19	235,1	38,1	6,17
	15	159.7	29.0	5,51	167,1	29,9	5,59	189,9	32,7	5,81	198,8	34,1	5,83	217,9	37,5	5,81	238,5	41,4	5,76
	18	159.7	30.3	5,27	167,4	31,3	5,35	189,9	34,2	5,55	198,5	35,6	5,58	219,2	39,3	5,58	238,6	43,0	5,55
	20	160.3	31.2	5,14	168,1	32,3	5,20	189,9	35,2	5,39	198,3	36,6	5,42	218,3	40,3	5,42	237,3	43,9	5,41
	22	160.9	32.2	5,00	168,9	33,3	5,07	189,9	36,2	5,25	197,8	37,7	5,25	216,4	41,1	5,27	236,1	44,7	5,28
	25	161.9	33.6	4,82	169,8	34,9	4,87	189,7	37,9	5,01	196,7	39,2	5,02	213,6	42,4	5,04	234,4	46,2	5,07
47000 m³/h	10	160.8	24.9	6,46	169,1	25,7	6,58	187,4	27,9	6,72	195,3	28,7	6,80	216,4	30,9	7,00	239,2	33,5	7,14
	15	160.4	27.0	5,94	167,9	27,8	6,04	190,7	29,9	6,38	199,9	30,9	6,47	220,3	33,6	6,56	243,1	36,6	6,64
	18	159.9	28.2	5,67	167,8	29,1	5,77	191,4	31,4	6,10	200,5	32,5	6,17	222,3	35,3	6,30	243,9	38,1	6,40
	20	160.5	29.0	5,53	168,5	30,0	5,62	191,9	32,4	5,92	200,8	33,5	5,99	221,9	36,2	6,13	243,4	38,9	6,26
	22	161.2	29.9	5,39	169,2	30,8	5,49	192,4	33,4	5,76	200,6	34,4	5,83	220,5	36,9	5,98	242,9	39,7	6,12
	25	162.3	31.2	5,20	170,1	32,2	5,28	191,6	34,8	5,51	199,3	35,7	5,58	218,3	37,9	5,76	242,1	41,1	5,89

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 70.4 Configuration CCKP

Cooling performance with 30% of outdoor and exhaust air

PORTATA ARIA	Ta [°C] DB/WB	TEMPERATURA ARIA ESTERNA °C D.B/W.B.																							
		20 / 12				25 / 18				30 / 22				35 / 24				40 / 25				45 / 26			
		kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER
29000 m³/h	22 / 16	207,3	153,1	40,6	5,11	226,1	159,1	45,6	4,96	225,9	153,5	51,0	4,43	218,6	153,1	56,8	3,85	206,2	155,9	64,3	3,21	217,1	169,8	74,2	2,93
	24 / 17	211,4	158,2	40,9	5,17	230,0	163,2	45,9	5,01	230,4	158,1	51,4	4,48	222,6	158,8	57,1	3,90	209,8	161,0	64,6	3,25	227,3	174,8	75,7	3,00
	26 / 18	216	162,6	41,2	5,24	226,6	163,1	46,2	4,90	234,9	162,4	51,8	4,53	225,7	164,2	57,5	3,93	214,0	165,5	64,8	3,30	238,2	181,5	76,8	3,10
	27 / 19	220,4	162,6	41,5	5,31	227,1	160,3	46,6	4,87	235,0	159,7	52,2	4,50	229,2	164,2	57,9	3,96	218,5	164,9	65,3	3,35	247,0	182,9	77,7	3,18
	28 / 20	225,0	162,3	41,8	5,38	227,7	157,4	46,9	4,86	235,2	156,9	52,5	4,48	232,8	164,1	58,2	4,00	223,1	164,4	65,8	3,39	256,3	184,4	78,6	3,26
	30 / 22	234,9	161,1	42,4	5,54	237,2	155,6	47,6	4,98	235,8	151,0	53,3	4,42	241,9	162,4	59,0	4,10	232,6	163,3	66,9	3,48	-	-	-	-
37000 m³/h	22 / 16	219,0	168,9	41,4	5,29	240,9	172,0	46,5	5,18	237,4	168,7	51,9	4,57	229,8	167,1	57,8	3,98	219,4	170,2	65,0	3,38	233,4	192,1	75,7	3,08
	24 / 17	224,1	174,5	41,7	5,37	243,6	178,6	46,8	5,21	242,4	173,7	52,3	4,63	233,3	175,8	58,0	4,02	222,4	176,7	65,7	3,39	242,2	194,9	76,2	3,18
	26 / 18	229,1	180,3	42,0	5,45	240,3	178,8	47,2	5,09	247,5	178,2	52,8	4,69	237,8	181,1	58,5	4,06	225,2	183,0	66,2	3,40	253,0	204,4	77,4	3,27
	27 / 19	234,3	179,1	42,4	5,53	241,4	174,9	47,6	5,07	247,5	175,4	53,2	4,65	242,1	180,3	59,0	4,10	229,6	182,9	66,8	3,44	261,7	207,5	78,4	3,34
	28 / 20	239,6	178,0	42,8	5,60	242,6	171,0	48,0	5,05	247,5	172,5	53,6	4,62	246,4	179,4	59,4	4,15	234,2	182,9	67,4	3,47	270,5	210,3	79,2	3,42
	30 / 22	250,4	175,6	43,5	5,76	252,6	168,7	48,7	5,19	247,6	166,6	54,4	4,55	255,1	177,6	60,4	4,22	243,9	182,4	68,6	3,56	-	-	-	-
47000 m³/h	22 / 16	229,8	185,4	42,2	5,45	252,5	187,9	47,3	5,34	248,8	183	52,8	4,71	240,4	182,6	58,7	4,10	227,9	189,4	65,9	3,46	249,4	218,0	76,6	3,26
	24 / 17	236,3	190,6	42,5	5,56	255,8	195,4	47,6	5,37	252,9	190,2	53,2	4,75	244,9	190,7	59,1	4,14	232,1	196,6	66,2	3,51	264,4	227,2	78,2	3,38
	26 / 18	242,8	195,5	42,9	5,66	251,5	197,0	48,0	5,24	257,2	197,2	53,7	4,79	248,3	198,9	59,5	4,17	236,4	203,4	66,4	3,56	263,2	247,2	78,7	3,34
	27 / 19	247,8	194,9	43,3	5,72	252,1	193,3	48,4	5,21	257,7	193,4	54,1	4,76	252,4	198,5	59,9	4,21	241,2	203,1	67,1	3,59	263,2	256,6	79,1	3,33
	28 / 20	252,9	194,2	43,6	5,80	252,6	189,5	48,8	5,18	258,3	189,5	54,5	4,74	256,5	198,1	60,4	4,25	246,3	202,9	67,8	3,63	266,3	266,3	79,4	3,35
	30 / 22	263,2	192,7	44,2	5,95	264,0	185,5	49,5	5,33	259,8	181,2	55,3	4,70	265,2	197	61,3	4,33	257,2	202,1	69,4	3,71	-	-	-	-

Heating performance with 30% of outdoor and exhaust air

PORTATA ARIA	Ta [°C] DB	TEMPERATURA ARIA ESTERNA °C.D.B/W.B.																		
		-7 / -8			-5 / -6			0 /-1			2 / 1			7 / 6			12 / 11		
		kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP
29000 m³/h	10	175.9	33.5	5,25	184,9	34,7	5,33	204,5	38,3	5,34	212,6	39,8	5,34	234,3	44,1	5,31	255,3	48,9	5,22
	15	176.0	36.1	4,88	184,6	37,4	4,94	207,2	41,1	5,04	216,8	42,9	5,05	236,8	47,6	4,97	257,2	52,7	4,88
	18	175.9	37.6	4,68	184,7	39,1	4,72	207,5	43,0	4,83	216,4	44,8	4,83	237,7	49,8	4,77	256,7	54,7	4,69
	20	176.4	38.8	4,55	185,2	40,3	4,60	207,8	44,3	4,69	216,2	46,1	4,69	236,5	51,0	4,64	255,4	55,8	4,58
	22	176.9	40.0	4,42	185,7	41,5	4,47	208,0	45,5	4,57	215,5	47,4	4,55	234,5	52,1	4,50	254,1	57,0	4,46
	25	177.7	41.8	4,25	186,3	43,4	4,29	206,8	47,6	4,34	213,9	49,4	4,33	231,4	53,7	4,31	252,1	59,0	4,27
37000 m³/h	10	177.2	31.6	5,61	185,8	32,6	5,70	206,1	35,5	5,81	214,9	36,8	5,84	237,6	40,3	5,90	260,1	44,5	5,84
	15	177.1	33.9	5,22	185,4	34,9	5,31	208,8	38,0	5,49	219,1	39,5	5,55	240,7	43,4	5,55	263,7	47,8	5,52
	18	176.8	35.2	5,02	185,4	36,4	5,09	209,2	39,7	5,27	218,9	41,2	5,31	242,0	45,2	5,35	264,0	49,5	5,33
	20	177.3	36.3	4,88	185,9	37,5	4,96	209,5	40,8	5,13	218,8	42,4	5,16	241,2	46,3	5,21	263,1	50,5	5,21
	22	177.8	37.4	4,75	186,4	38,5	4,84	209,8	42,0	5,00	218,3	43,5	5,02	239,4	47,2	5,07	262,2	51,4	5,10
	25	178.5	38.9	4,59	187,0	40,1	4,66	208,6	43,7	4,77	216,7	45,1	4,80	236,8	48,6	4,87	260,7	53,2	4,90
47000 m³/h	10	177.5	29.9	5,94	186,1	30,8	6,04	207,4	33,5	6,19	216,2	34,5	6,27	239,8	37,4	6,41	264,1	40,8	6,47
	15	177.4	32.2	5,51	185,4	33,2	5,58	209,2	35,5	5,89	220,6	36,9	5,98	243,7	40,3	6,05	267,5	44,0	6,08
	18	177.1	33.6	5,27	185,6	34,6	5,36	210,5	37,3	5,64	221,1	38,6	5,73	245,5	42,1	5,83	268,0	45,7	5,86
	20	177.7	34.6	5,14	186,5	35,7	5,22	211,3	38,4	5,50	221,4	39,8	5,56	244,7	43,1	5,68	267,3	46,7	5,72
	22	178.4	35.6	5,01	187,4	36,7	5,11	212,1	39,6	5,36	221,0	40,8	5,42	242,7	44,0	5,52	266,6	47,7	5,59
	25	179.4	37.1	4,84	188,5	38,3	4,92	211,1	41,1	5,14	219,3	42,3	5,18	239,8	45,3	5,29	265,7	49,3	5,39

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 80.4 Configuration CCKP

Cooling performance with 30% of outdoor and exhaust air

PORTATA ARIA	Ta [°C] DB/WB	TEMPERATURA ARIA ESTERNA °C D.B/W.B.																							
		20 / 12				25 / 18				30 / 22				35 / 24				40 / 25				45 / 26			
		kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER
29000 m³/h	22 / 16	221,2	164,8	44,2	5,00	245	169,9	49,7	4,93	247,6	163,1	55,9	4,43	239,3	163,1	62,3	3,84	225,4	164,1	70,9	3,18	225	172,4	77,3	2,91
	24 / 17	227,7	168,3	44,5	5,12	248,5	174,6	49,9	4,98	252,1	167,8	56,3	4,48	242,6	170,5	62,3	3,89	230,5	167,4	71,3	3,23	227,2	177,4	77,7	2,92
	26 / 18	233,7	172,0	44,7	5,23	244,6	174,4	50,2	4,87	256,8	172,1	56,7	4,53	248,3	174,2	62,7	3,96	235,7	170,1	71,7	3,29	232,2	180,8	78,4	2,96
	27 / 19	238,5	172,0	45,0	5,30	245,0	171,8	50,5	4,85	257,4	169,2	57,0	4,52	253,6	173,1	63,1	4,02	239,8	170	72,2	3,32	237,2	179,6	79,0	3,00
	28 / 20	243,3	172,0	45,2	5,38	245,6	169,1	50,8	4,83	258,1	166,3	57,3	4,50	258,9	172,1	63,4	4,08	243,8	170,2	72,7	3,35	242,3	178,4	79,6	3,04
	30 / 22	253,2	171,6	45,8	5,53	257,5	166,4	51,5	5,00	259,4	160,6	57,9	4,48	268,9	170,6	64,3	4,18	252,1	170,3	73,7	3,42	-	-	-	-
44000 m³/h	22 / 16	248,7	190,7	45,7	5,44	274,7	195,1	51,2	5,37	272,7	189,9	57,4	4,75	263,7	189,0	64,0	4,12	245,4	193,6	72,9	3,37	251,5	205,1	80,1	3,14
	24 / 17	254,4	197,3	46	5,53	278,4	202,0	51,5	5,41	277,8	196,5	57,9	4,80	268,4	197,2	64,3	4,17	250,0	200,3	73,1	3,42	253,6	213,5	80,3	3,16
	26 / 18	260,2	203,6	46,2	5,63	274,1	203,0	51,8	5,29	282,4	203,2	58,3	4,84	274,2	203,1	64,7	4,24	254,3	207,1	73,3	3,47	261,1	219,4	81,4	3,21
	27 / 19	266,5	202,2	46,6	5,72	275,1	199,2	52,1	5,28	283,4	199,2	58,6	4,84	279,5	202,4	65,1	4,29	259,2	207,1	73,7	3,52	267,8	219,8	82,3	3,25
	28 / 20	272,9	200,5	47,0	5,81	276,1	195,4	52,5	5,26	284,3	195,3	59,0	4,82	284,7	201,6	65,4	4,35	264,3	207	74,1	3,57	274,6	220,0	83,2	3,30
	30 / 22	286,5	196,4	47,9	5,98	288,2	191,9	53,4	5,40	286,0	187,6	59,7	4,79	294,3	200,2	66,3	4,44	275,0	206,5	75,0	3,67	-	-	-	-
47000 m³/h	22 / 16	253,4	194,7	45,8	5,53	279,3	199,0	51,5	5,42	275,2	196,3	57,5	4,79	266,0	195,6	64,1	4,15	251,1	196,4	72,9	3,44	255,8	212,6	80,5	3,18
	24 / 17	258,8	201,8	46,1	5,61	283,7	205,1	51,9	5,47	281,6	201,5	58,0	4,86	271,3	203,7	64,4	4,21	253,9	205,7	73,2	3,47	258,0	220,1	80,7	3,20
	26 / 18	264,5	208,4	46,5	5,69	279,1	206,3	52,3	5,34	287,4	207,1	58,5	4,91	276,6	210,5	64,7	4,28	255,9	215,6	73,3	3,49	263,0	226,6	81,4	3,23
	27 / 19	270,8	207,0	46,8	5,79	279,8	202,5	52,6	5,32	287,8	203,8	58,8	4,89	281,6	210,1	65,1	4,33	261,4	214,8	73,8	3,54	268,0	227,2	82,0	3,27
	28 / 20	277,2	205,4	47,2	5,87	280,5	198,8	53,0	5,29	288,3	200,4	59,1	4,88	286,7	209,6	65,4	4,38	267,3	213,6	74,3	3,60	273,1	227,8	82,5	3,31
	30 / 22	290,3	201,8	48,1	6,04	291,8	196,4	53,8	5,42	289,5	193,4	59,7	4,85	296,5	208,0	66,3	4,47	279,1	211,3	75,3	3,71	-	-	-	-

Heating performance with 30% of outdoor and exhaust air

PORTATA ARIA	Ta [°C] DB	TEMPERATURA ARIA ESTERNA °C.D.B/W.B.																		
		-7 / -8			-5 / -6			0 /-1			2 / 1			7 / 6			12 / 11		
		kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP
29000 m³/h	10	203.6	40.3	5,05	213,7	42,0	5,09	236,2	46,8	5,05	245,1	49	5,00	268	54,7	4,90	288,8	60,7	4,76
	15	203.8	43.5	4,69	213,3	45,2	4,72	239,2	50,2	4,76	249,5	52,7	4,73	269,9	58,7	4,60	289,5	65,1	4,45
	18	203.6	45.4	4,48	213,6	47,3	4,52	239,6	52,5	4,56	249,1	54,9	4,54	270,5	61,0	4,43	288,7	67,4	4,28
	20	204.4	46.9	4,36	214,4	48,8	4,39	239,8	54,1	4,43	248,8	56,4	4,41	268,8	62,4	4,31	287,3	68,7	4,18
	22	205.3	48.4	4,24	215,2	50,2	4,29	240,1	55,7	4,31	247,8	57,9	4,28	266,0	63,6	4,18	286,0	70,1	4,08
	25	206.6	50.6	4,08	216,0	52,5	4,11	238,3	57,8	4,12	245,2	60,0	4,09	261,8	65,5	4,00	285,4	70,4	4,05
44000 m³/h	10	204.9	35.8	5,72	215,5	37,0	5,82	239,2	40,6	5,89	249,1	42,0	5,93	274,5	45,9	5,98	300,7	50,6	5,94
	15	205.2	38.5	5,33	215,1	39,8	5,40	243,0	43,5	5,59	254,3	45,2	5,63	278,3	49,5	5,62	305,2	54,4	5,61
	18	205.0	40.1	5,11	215,3	41,5	5,19	243,8	45,5	5,36	254,4	47,3	5,38	280,1	51,8	5,41	305,3	56,3	5,42
	20	205.8	41.4	4,97	216,1	42,8	5,05	244,4	46,9	5,21	254,5	48,7	5,23	279,1	53,0	5,27	303,7	57,4	5,29
	22	206.7	42.6	4,85	217,0	44,1	4,92	244,9	48,2	5,08	253,9	50,0	5,08	277,0	53,9	5,14	302,2	58,4	5,17
	25	207.9	44.5	4,67	218,0	46,1	4,73	243,5	50,1	4,86	252,0	51,6	4,88	273,9	55,4	4,94	300,2	60,4	4,97
47000 m³/h	10	205.2	35.2	5,83	215,9	36,4	5,93	239,2	39,8	6,01	249,1	41,1	6,06	275,5	44,9	6,14	302,3	49,4	6,12
	15	205.4	37.9	5,42	215,2	39,2	5,49	242,3	42,3	5,73	254,4	44,1	5,77	279,3	48,5	5,76	305,9	53,1	5,76
	18	205.1	39.6	5,18	215,4	40,9	5,27	242,9	44,4	5,47	254,4	46,3	5,49	280,9	50,7	5,54	305,9	55,1	5,55
	20	206.0	40.8	5,05	216,3	42,2	5,13	243,3	45,8	5,31	254,5	47,7	5,34	280,0	51,9	5,39	304,7	56,1	5,43
	22	206.9	42.0	4,93	217,2	43,5	4,99	243,8	47,2	5,17	254,0	49,0	5,18	277,9	52,9	5,25	303,5	57,2	5,31
	25	208.2	43.9	4,74	218,4	45,4	4,81	243,1	49,1	4,95	252,5	50,7	4,98	274,8	54,5	5,04	301,8	59,1	5,11

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 90.4 Configuration CCKP

Cooling performance with 30% of outdoor and exhaust air

PORTATA ARIA	Ta [°C] DB/WB	TEMPERATURA ARIA ESTERNA °C D.B/W.B.																							
		20 / 12				25 / 18				30 / 22				35 / 24				40 / 25				45 / 26			
		kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER
38000 m³/h	22 / 16	276,7	202,5	52,6	5,26	303,8	210,6	59,2	5,13	304,6	206,9	65,6	4,64	298,6	204,7	73,1	4,08	286,4	205,5	81,8	3,50	281,1	213,2	91,7	3,07
	24 / 17	281,6	209,9	52,9	5,32	308,7	216,3	59,5	5,19	309,4	213,6	66,0	4,69	303,5	212,5	73,5	4,13	289,9	212,2	82,4	3,52	284,2	219,9	92,2	3,08
	26 / 18	286,4	217,2	53,2	5,38	303,7	216,5	59,9	5,07	313,7	220,9	66,5	4,72	306,7	220,7	73,8	4,16	292,9	219,2	82,9	3,53	287,2	227,1	92,9	3,09
	27 / 19	293,7	215,8	53,6	5,48	304,6	212,8	60,2	5,06	315,2	216,4	66,9	4,71	311,5	220,9	74,3	4,19	297,8	219,6	83,3	3,58	291,7	227,0	93,6	3,12
	28 / 20	301,2	214,4	54,0	5,58	305,6	209,1	60,7	5,03	316,7	212,0	67,4	4,70	316,4	221,0	74,7	4,24	303,1	220	83,7	3,62	296,3	226,8	94,3	3,14
	30 / 22	316,3	211,4	54,9	5,76	319,3	206,3	61,6	5,18	320,0	203,0	68,3	4,69	330,0	217,7	75,8	4,35	314,0	220,4	84,5	3,72	-	-	-	-
51000 m³/h	22 / 16	297,7	227,6	53,8	5,53	327,6	233,9	60,5	5,41	328,1	227,4	67,3	4,88	317,8	228,5	74,8	4,25	303,4	232,6	83,1	3,65	299,1	245,6	93,7	3,19
	24 / 17	305,8	233,9	54,2	5,64	333,2	240,7	60,8	5,48	334,0	235,8	67,7	4,93	324,5	236,4	75,4	4,30	308,8	240,0	83,6	3,69	300,2	256,2	94,2	3,19
	26 / 18	313,7	240,3	54,5	5,76	328,9	240,7	61,4	5,36	339,8	243,7	68,2	4,98	329,8	245,2	75,8	4,35	313,6	248,0	84,0	3,73	308,5	261,1	95,7	3,22
	27 / 19	319,9	240,4	54,9	5,83	330,1	236,0	61,9	5,33	340,1	240,2	68,6	4,96	335,3	245,1	76,3	4,39	319,1	248,1	84,6	3,77	316	260,1	96,9	3,26
	28 / 20	326,2	240,3	55,3	5,90	331,2	231,3	62,4	5,31	340,5	236,5	69,0	4,93	340,9	244,8	76,8	4,44	324,8	248,2	85,1	3,82	323,7	259,0	98,1	3,30
	30 / 22	339,2	239,5	56,0	6,06	344,7	228,8	63,3	5,45	341,9	228,4	69,8	4,90	352,4	243,5	77,9	4,52	336,4	248,2	86,3	3,90	-	-	-	-
60000 m³/h	22 / 16	309,6	240,6	54,5	5,68	338,8	248,2	61,2	5,54	338,8	241,1	68,0	4,98	327,8	243,3	75,4	4,35	309,9	251,5	84,0	3,69	310,6	263,5	95,2	3,26
	24 / 17	316,2	250,3	54,7	5,78	344,0	256,4	61,7	5,58	344,8	251,4	68,4	5,04	332,5	255,6	75,8	4,39	314,4	260,6	84,5	3,72	316,3	269,5	96,4	3,28
	26 / 18	322,8	259,7	55,0	5,87	338,6	258,4	62,1	5,45	351,5	260,2	68,8	5,11	338,7	264,5	76,4	4,43	319,1	269,4	85,0	3,75	339,8	284,7	100,0	3,40
	27 / 19	330,4	257,9	55,5	5,95	339,5	253,9	62,5	5,43	352,2	255,3	69,3	5,08	345,0	263,1	76,9	4,49	325,1	269,4	85,4	3,81	356,7	290,4	102,5	3,48
	28 / 20	338,1	256,2	55,9	6,05	340,4	249,3	62,9	5,41	353,1	250,3	69,8	5,06	351,4	261,7	77,5	4,53	331,5	269,4	85,9	3,86	374,3	296,2	105,1	3,56
	30 / 22	353,4	252,7	56,8	6,22	356,0	244,6	63,9	5,57	355,0	240,1	70,9	5,01	363,6	260,0	78,6	4,63	344,4	269,1	86,9	3,96	-	-	-	-

Heating performance with 30% of outdoor and exhaust air

PORTATA ARIA	Ta [°C] DB	TEMPERATURA ARIA ESTERNA °C.D.B/W.B.																		
		-7 / -8			-5 / -6			0 /-1			2 / 1			7 / 6			12 / 11		
		kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP
38000 m³/h	10	238.7	44.8	5,33	250,7	46,5	5,39	278	52,1	5,34	290,1	54,5	5,32	319,7	60,8	5,26	346,9	67,6	5,13
	15	239.9	48.8	4,92	251,4	50,6	4,97	282,2	56,1	5,03	295,7	58,8	5,03	322,6	65,3	4,94	348,5	72,4	4,81
	18	240.3	51.2	4,69	252,1	53,2	4,74	282,8	58,8	4,81	295,5	61,4	4,81	323,6	67,9	4,77	347,8	74,9	4,64
	20	241.3	52.9	4,56	253,0	54,9	4,61	283,2	60,7	4,67	295,4	63,2	4,67	322	69,5	4,63	346,2	76,4	4,53
	22	242.2	54.6	4,44	253,9	56,6	4,49	283,6	62,5	4,54	294,7	64,9	4,54	319,1	71,0	4,49	344,7	77,8	4,43
	25	243.6	57.2	4,26	255,0	59,3	4,30	282,7	65,3	4,33	292,5	67,5	4,33	314,8	73,1	4,31	343,0	80,8	4,25
51000 m³/h	10	239.2	41.0	5,83	251,2	42,6	5,90	282,2	47,2	5,98	294,2	49,0	6,00	324,9	53,7	6,05	356,5	59,3	6,01
	15	239.9	44.6	5,38	251,3	46,2	5,44	286,5	50,7	5,65	300,0	52,8	5,68	329,2	58,2	5,66	360,2	64,3	5,60
	18	240.0	46.7	5,14	251,9	48,4	5,20	286,4	53,2	5,38	299,7	55,4	5,41	331,0	61,1	5,42	360,4	66,6	5,41
	20	241.0	48.3	4,99	252,9	49,9	5,07	286,4	54,9	5,22	299,4	57,2	5,23	329,9	62,5	5,28	359,3	67,7	5,31
	22	242.1	49.8	4,86	253,9	51,5	4,93	286,3	56,6	5,06	298,8	58,7	5,09	327,5	63,6	5,15	358,1	68,8	5,20
	25	243.6	52.1	4,68	255,2	53,8	4,74	285,8	58,9	4,85	297,2	60,7	4,90	323,8	65,2	4,97	356,1	71,1	5,01
60000 m³/h	10	240.4	39.4	6,10	253,1	41,0	6,17	282,5	45,0	6,28	294,1	46,6	6,31	326,0	51,0	6,39	359,9	55,8	6,45
	15	241.0	42.9	5,62	252,8	44,5	5,68	286,6	48,1	5,96	300,4	50,2	5,98	330,5	55,2	5,99	364,2	60,2	6,05
	18	241.1	45.0	5,36	253,1	46,7	5,42	287,5	50,4	5,70	300,6	52,6	5,71	332,4	57,7	5,76	364,8	62,5	5,84
	20	242.0	46.5	5,20	254,1	48,2	5,27	288,1	52,0	5,54	300,7	54,2	5,55	331,7	59,1	5,61	363,9	63,9	5,69
	22	243.0	48.1	5,05	255	49,8	5,12	288,7	53,5	5,40	300,3	55,6	5,40	329,9	60,3	5,47	363,0	65,2	5,57
	25	244.4	50.3	4,86	256,1	52,1	4,92	287,4	55,7	5,16	298,8	57,7	5,18	327,3	62,1	5,27	361,5	67,5	5,36

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 100.4 Configuration CCKP

Cooling performance with 30% of outdoor and exhaust air

PORTATA ARIA	Ta [°C] DB/WB	TEMPERATURA ARIA ESTERNA °C D.B/W.B.																							
		20 / 12				25 / 18				30 / 22				35 / 24				40 / 25				45 / 26			
		kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER
38000 m³/h	22 / 16	281,9	210,6	57,8	4,88	312,9	217	64,8	4,83	312,3	212,1	72,6	4,30	306,3	209,2	81,2	3,77	295,8	209,3	90,9	3,25	292,5	218,3	102,1	2,86
	24 / 17	289,9	215,3	58,3	4,97	316,9	223,4	65,1	4,87	317,2	218,6	73,1	4,34	311,7	216,5	81,6	3,82	299,7	215,5	91,4	3,28	294,3	226,1	102,6	2,87
	26 / 18	297,5	220,0	58,7	5,07	312,4	222,4	65,7	4,75	321,3	225,9	73,6	4,37	316,5	223,8	81,9	3,86	302,9	222,1	91,8	3,30	298,5	232,5	103,5	2,88
	27 / 19	304,7	219,1	59,2	5,15	313,9	218,2	66,2	4,74	322,7	221,7	74,1	4,35	322,2	223,7	82,3	3,91	308,5	221,9	92,4	3,34	303,9	231,8	104,4	2,91
	28 / 20	311,9	218,3	59,6	5,23	315,5	214	66,7	4,73	324,2	217,5	74,6	4,35	327,9	223,5	82,7	3,96	314,4	221,7	93,1	3,38	309,5	231,0	105,3	2,94
	30 / 22	326,4	216,8	60,5	5,40	328,8	212,2	67,6	4,86	327,1	209	75,6	4,33	341,0	221,0	84,0	4,06	326,4	221,2	94,5	3,45	-	-	-	-
56000 m³/h	22 / 16	315,8	241,2	59,9	5,27	348,8	246,0	67,2	5,19	349,1	236,6	75,2	4,64	334,4	242,4	83,3	4,01	316,2	250,9	92,9	3,40	317,2	264,2	105,5	3,01
	24 / 17	322,6	249,7	60,3	5,35	355,4	252,1	67,7	5,25	354,2	246,6	75,8	4,67	341,5	251,3	83,8	4,08	322,2	257,1	93,8	3,43	323,9	272,2	107,1	3,02
	26 / 18	329,3	258,2	60,7	5,43	349,7	253,6	68,2	5,13	359,4	256	76,3	4,71	349,1	258,0	84,5	4,13	328,1	263,1	94,8	3,46	335,2	280,5	109	3,08
	27 / 19	337,0	257,2	61,1	5,52	350,1	249,8	68,6	5,10	360,3	251,5	76,8	4,69	356,0	256,5	85,1	4,18	334,4	263	95,4	3,51	343,9	282	110,4	3,12
	28 / 20	344,9	255,9	61,6	5,60	350,6	245,9	69,1	5,07	361,4	246,8	77,3	4,68	363,0	254,8	85,8	4,23	340,8	263,2	96,0	3,55	353,0	283,4	111,9	3,15
	30 / 22	361,2	252,7	62,6	5,77	364,3	243,7	70,2	5,19	363,9	237,0	78,3	4,65	375,6	253,4	87,0	4,32	353,9	263,4	97,1	3,64	-	-	--	-
60000 m³/h	22 / 16	320,2	248,6	60,1	5,33	352,5	253,7	67,5	5,22	351,0	246,7	75,3	4,66	340,8	245,5	83,9	4,06	320,7	255,7	93,8	3,42	322,9	274,6	106,7	3,03
	24 / 17	327,5	257,1	60,5	5,41	357,7	262,6	67,8	5,28	357,5	255,4	75,9	4,71	346,3	256,4	84,5	4,10	327,6	262,8	94,4	3,47	332,4	281,0	108,6	3,06
	26 / 18	335,0	265,0	61,0	5,49	353,6	262,5	68,4	5,17	363,6	264,2	76,5	4,75	352,1	266,7	84,9	4,15	334,5	269,4	95	3,52	343,2	288,9	110,1	3,12
	27 / 19	343,0	263,6	61,5	5,58	355,4	256,9	68,9	5,16	364,5	259,4	77,0	4,73	358,1	266,8	85,4	4,19	340,9	269,2	95,6	3,57	351,7	290,2	111,2	3,16
	28 / 20	351,2	262,0	62,0	5,66	357,1	251,5	69,4	5,15	365,4	254,7	77,6	4,71	364,2	266,8	85,8	4,24	347,2	269,3	96,3	3,61	360,3	291,5	112,4	3,21
	30 / 22	367,8	258,4	63,0	5,84	371,5	248,7	70,5	5,27	367,1	245,4	78,6	4,67	378,7	263,0	87,2	4,34	360,1	269,3	97,7	3,69	-	-	-	-

Heating performance with 30% of outdoor and exhaust air

PORTATA ARIA	Ta [°C] DB	TEMPERATURA ARIA ESTERNA °C.D.B/W.B.																		
		-7 / -8			-5 / -6			0 /-1			2 / 1			7 / 6			12 / 11		
		kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP
38000 m³/h	10	254.8	50.3	5,07	267,7	52,2	5,13	298,4	58,6	5,09	309,7	61	5,08	339,6	67,7	5,02	369,8	75,6	4,89
	15	255.8	54.6	4,68	268,1	56,8	4,72	302,2	62,8	4,81	315,2	65,7	4,80	343,4	73,0	4,70	371,2	81,2	4,57
	18	256.2	57.3	4,47	268,7	59,6	4,51	303,4	66,0	4,60	315,7	68,8	4,59	345,2	76,2	4,53	370,4	84,3	4,39
	20	257.1	59.3	4,34	269,5	61,7	4,37	304,2	68,2	4,46	316,1	70,9	4,46	343,4	78,0	4,40	368,9	86,2	4,28
	22	258.1	61.2	4,22	270,3	63,7	4,24	304,9	70,3	4,34	315,3	72,8	4,33	340,2	79,7	4,27	367,3	88,0	4,17
	25	259.5	64.2	4,04	271,4	66,8	4,06	303,1	73,2	4,14	312,3	75,6	4,13	335,3	82,2	4,08	366,7	90,2	4,07
56000 m³/h	10	256.8	44.8	5,73	269,9	46,4	5,82	301,3	51,0	5,91	313,7	52,9	5,93	347,4	57,8	6,01	381,3	63,6	6,00
	15	257.4	48.7	5,29	270,1	50,4	5,36	304,3	54,6	5,57	319,7	56,9	5,62	352,1	62,7	5,62	386,0	69,1	5,59
	18	257.5	51.0	5,05	270,5	52,8	5,12	305,4	57,4	5,32	319,9	59,7	5,36	354,1	65,8	5,38	386,6	71,6	5,40
	20	258.4	52.7	4,90	271,3	54,5	4,98	306,2	59,3	5,16	320,0	61,6	5,19	353	67,3	5,25	385,7	72,8	5,30
	22	259.2	54.4	4,76	272,1	56,3	4,83	306,9	61,1	5,02	319,6	63,3	5,05	350,5	68,4	5,12	384,7	74,1	5,19
	25	260.5	57.0	4,57	273,0	58,8	4,64	306,4	63,5	4,83	318,0	65,4	4,86	346,8	70,0	4,95	383,1	76,5	5,01
60000 m³/h	10	214.5	44.7	4,80	226,3	46,5	4,87	258,7	50,9	5,08	274,3	53,0	5,18	313,2	58,2	5,38	355,2	64,0	5,55
	15	213.5	48.3	4,42	225,3	50,1	4,50	257,7	54,5	4,73	272,9	56,7	4,81	310,2	62,4	4,97	351,0	68,5	5,12
	18	213.0	50.4	4,23	224,7	52,3	4,30	257,2	56,8	4,53	271,9	59,2	4,59	308,3	65,0	4,74	348,3	71,3	4,88
	20	212.7	51.9	4,10	224,3	53,8	4,17	256,8	58,4	4,40	271,2	60,8	4,46	307,1	66,8	4,60	346,3	73,4	4,72
	22	212.5	53.4	3,98	223,8	55,3	4,05	256,5	59,9	4,28	270,6	62,5	4,33	305,9	68,7	4,45	344,4	75,4	4,57
	25	212.2	55.7	3,81	223,2	57,6	3,88	255,9	62,7	4,08	269,7	65,2	4,14	304,2	71,5	4,25	341,3	78,5	4,35

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 110.4 Configuration CCKP

Cooling performance with 30% of outdoor and exhaust air

PORTATA ARIA	Ta [°C] DB/WB	TEMPERATURA ARIA ESTERNA °C D.B/W.B.																							
		20 / 12				25 / 18				30 / 22				35 / 24				40 / 25				45 / 26			
		kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER
38000 m³/h	22 / 16	296,1	218,4	64,3	4,60	327,5	225,6	72,1	4,54	326,1	221,2	80,8	4,04	321,7	216,2	90,1	3,57	309,4	216,0	101,1	3,06	308,1	226,8	113,2	2,72
	24 / 17	303,9	223,2	64,8	4,69	331,4	232,3	72,4	4,58	334,8	224,8	81,5	4,11	326,7	224,2	90,6	3,61	310,4	225,0	101,5	3,06	313,6	231,1	114,3	2,74
	26 / 18	312,3	227,2	65,5	4,77	326,7	231,2	73,0	4,48	343,0	228,6	82,2	4,17	332,5	230,2	91,1	3,65	312,1	233,2	102,1	3,06	317,6	239,9	115,7	2,75
	27 / 19	318,8	227,2	65,9	4,84	328,0	226,9	73,6	4,46	343,1	225,4	82,6	4,15	338,8	229,7	91,7	3,69	318,5	232,6	102,7	3,10	322,9	241,1	116,9	2,76
	28 / 20	325,6	226,9	66,4	4,90	329,5	222,6	74,2	4,44	343,4	222,1	83,1	4,13	345,1	229	92,2	3,74	325,8	231,5	103,3	3,15	328,3	242,3	118,1	2,78
	30 / 22	340,2	225,7	67,4	5,05	343,9	220,3	75,2	4,57	344,4	215,1	84,1	4,10	358,6	226,6	93,5	3,84	340,8	229,1	104,7	3,26	-	-	-	-
60000 m³/h	22 / 16	336,8	258,2	67,1	5,02	370,9	264,4	75,1	4,94	369,0	256,2	83,9	4,40	357,5	254,8	93,3	3,83	338,4	262,5	104,3	3,24	348,1	280,9	112,0	3,11
	24 / 17	344,4	266,3	67,7	5,09	377,7	270,8	75,8	4,98	376,9	263,7	84,6	4,46	365,1	263,5	94,0	3,88	342,6	272,7	104,9	3,27	351,4	293,6	106,0	3,32
	26 / 18	352,1	274,0	68,3	5,16	372,9	270,5	76,4	4,88	383,2	272,7	85,2	4,50	370,2	273,7	94,7	3,91	346,4	282,9	105,5	3,28	357,4	298,6	107,3	3,33
	27 / 19	360,7	272,3	68,8	5,24	374,2	265,2	77,0	4,86	383,8	267,7	85,8	4,47	376,2	273,6	95,3	3,95	353,8	281,8	106,3	3,33	363,6	297,0	107,8	3,37
	28 / 20	369,5	270,5	69,4	5,32	375,7	259,9	77,6	4,84	384,4	262,7	86,5	4,44	382,3	273,2	96,0	3,98	361,7	280,5	107,2	3,37	370,0	295,0	108,3	3,42
	30 / 22	387,7	266,2	70,5	5,50	391,4	256,2	78,9	4,96	385,6	252,8	87,8	4,39	397	270,4	97,3	4,08	377,7	277,8	109,0	3,47	-	-	-	-

Heating performance with 30% of outdoor and exhaust air

PORTATA ARIA	Ta [°C] DB	TEMPERATURA ARIA ESTERNA °C.D.B/W.B.																		
		-7 / -8			-5 / -6			0 /-1			2 / 1			7 / 6			12 / 11		
		kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP
38000 m³/h	10	276.7	57.4	4,82	290,2	59,8	4,85	323	67,5	4,79	335,4	70,7	4,74	366,2	78,5	4,66	394,8	87,4	4,52
	15	278.0	62.6	4,44	290,7	65,2	4,46	329,1	72,9	4,51	342,3	76,2	4,49	369,6	84,6	4,37	397,5	94,1	4,22
	18	278.4	65.7	4,24	291,9	68,6	4,26	328,9	76,6	4,29	341,4	80,0	4,27	370,8	88,5	4,19	400,3	99,1	4,04
	20	280.1	68.1	4,11	293,8	71,1	4,13	328,9	79,1	4,16	340,9	82,4	4,14	368,9	90,7	4,07	402,9	102,9	3,92
	22	281.9	70.5	4,00	295,8	73,6	4,02	328,8	81,5	4,03	339,7	84,7	4,01	365,5	92,6	3,95	405,5	106,7	3,80
	25	284.5	74.1	3,84	298,2	77,3	3,86	327,4	85	3,85	336,9	87,8	3,84	360,5	95,4	3,78	380,7	109,1	3,49
60000 m³/h	10	278.1	49.6	5,61	292,4	51,5	5,68	325,4	56,6	5,75	339,3	58,9	5,76	376,3	64,8	5,81	413,4	71,1	5,81
	15	279.2	54.0	5,17	292,4	55,8	5,24	329,9	60,5	5,45	346,5	63,4	5,47	381,3	70,0	5,45	417,6	77,0	5,42
	18	279.5	56.6	4,94	293,0	58,5	5,01	331,9	63,6	5,22	347,4	66,4	5,23	383,4	73,1	5,24	417,7	79,9	5,23
	20	280.5	58.5	4,79	294,0	60,5	4,86	333,2	65,7	5,07	347,9	68,4	5,09	382,2	75,0	5,10	416,2	81,6	5,10
	22	281.5	60.4	4,66	295,1	62,5	4,72	334,5	67,8	4,93	347,5	70,3	4,94	379,5	76,6	4,95	414,8	83,2	4,99
	25	283.1	63.3	4,47	296,5	65,4	4,53	332,8	70,9	4,69	345,2	73,3	4,71	375,6	79,1	4,75	412,8	86,1	4,79

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.

Prerformance

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	570
	Airflow	m^3/h	26000	26000	26000	26000	26000	26000	26000	26000	26000	26000	26000	26000	26000	26000	26000	26000
	Airflow	l/s	7222	7222	7222	7222	7222	7222	7222	7222	7222	7222	7222	7222	7222	7222	7222	7222
49.4	Fan RPM	rpm	1183	1192	1210	1236	1262	1285	1311	1337	1364	1387	1413	1439	1462	1488	1535	1585
	Sound pressure	dB(A)	83,2	83,2	83,1	83,4	83,7	84	84,4	84,6	84,6	84,6	84,6	84,7	84,7	84,7	85	85,7
	Total input	kW	2,94	3,03	3,21	3,48	3,77	4,02	4,34	4,65	4,92	5,16	5,44	5,74	6,00	6,31	6,92	7,60
	Airflow	m^3/h	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	-
	Airflow	l/s	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	-
54.4	Fan RPM	rpm	1300	1308	1323	1347	1368	1392	1413	1436	1460	1481	1505	1526	1550	1574	1619	-
	Sound pressure	dB(A)	85,7	85,6	85,6	85,5	85,6	85,9	86,1	86,4	86,7	87,0	87,0	87,0	87,0	87,0	87,1	-
	Total input	kW	3,77	3,86	4,04	4,34	4,62	4,93	5,21	5,55	5,90	6,23	6,56	6,83	7,15	7,47	8,11	-
	Airflow	m^3/h	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000
	Airflow	l/s	9167	9167	9167	9167	9167	9167	9167	9167	9167	9167	9167	9167	9167	9167	9167	9167
60.4	Fan RPM	rpm	1141	1150	1166	1194	1221	1246	1274	1299	1327	1355	1379	1407	1435	1457	1507	1559
	Sound pressure	dB(A)	83,4	83,4	83,5	83,9	84,2	84,6	84,9	84,9	84,9	84,9	84,9	85,0	85,0	85,2	85,9	86,6
	Total input	kW	3,60	3,72	3,91	4,28	4,64	5,00	5,40	5,72	6,04	6,44	6,76	7,16	7,56	7,92	8,72	9,68
	Airflow	m^3/h	37000	37000	37000	37000	37000	37000	37000	37000	37000	37000	37000	37000	37000	37000	37000	-
	Airflow	l/s	10278	10278	10278	10278	10278	10278	10278	10278	10278	10278	10278	10278	10278	10278	10278	-
70.4	Fan RPM	rpm	1257	1263	1280	1305	1327	1351	1378	1398	1423	1445	1470	1495	1517	1542	1590	-
	Sound pressure	dB(A)	86	86,0	85,9	85,9	86,2	86,5	86,8	87,1	87,4	87,4	87,4	87,4	87,4	87,4	87,5	-
	Total input	kW	4,60	4,72	4,96	5,36	5,72	6,12	6,52	6,92	7,40	7,76	8,16	8,56	8,92	9,36	10,24	-
	Airflow	m^3/h	44000	44000	44000	44000	44000	44000	44000	44000	44000	44000	44000	-	-	-	-	-
	Airflow	l/s	12222	12222	12222	12222	12222	12222	12222	12222	12222	12222	12222	-	-	-	-	-
80.4	Fan RPM	rpm	1456	1463	1477	1497	1518	1539	1558	1579	1597	1618	1636	-	-	-	-	-
	Sound pressure	dB(A)	89,9	89,8	89,8	89,7	89,7	89,6	89,8	90,0	90,2	90,4	90,6	-	-	-	-	-
	Total input	kW	6,84	6,96	7,28	7,68	8,12	8,60	9,00	9,48	9,92	10,44	10,92	-	-	-	-	-
	Airflow	m^3/h	51000	51000	51000	51000	51000	51000	51000	51000	51000	51000	51000	51000	51000	51000	51000	51000
	Airflow	l/s	14167	14167	14167	14167	14167	14167	14167	14167	14167	14167	14167	14167	14167	14167	14167	14167
90.4	Fan RPM	rpm	1184	1193	1211	1235	1262	1289	1313	1340	1364	1391	1418	1442	1468	1491	1540	1591
	Sound pressure	dB(A)	85,9	85,8	86,0	86,4	86,7	87,1	87,3	87,3	87,3	87,3	87,4	87,4	87,5	87,5	88,2	88,8
	Total input	kW	6,06	6,24	6,60	7,08	7,62	8,28	8,82	9,36	9,84	10,38	10,98	11,52	12,12	12,72	13,98	15,36
	Airflow	m^3/h	56000	56000	56000	56000	56000	56000	56000	56000	56000	56000	56000	56000	56000	56000	56000	-
	Airflow	l/s	15556	15556	15556	15556	15556	15556	15556	15556	15556	15556	15556	15556	15556	15556	15556	-
100.4	Fan RPM	rpm	1286	1294	1310	1332	1357	1381	1403	1427	1452	1474	1496	1521	1545	1570	1615	-
	Sound pressure	dB(A)	87,9	87,9	87,9	88,1	88,4	88,6	88,9	89,2	89,4	89,3	89,3	89,3	89,4	89,4	89,5	-
	Total input	kW	7,56	7,68	8,10	8,64	9,24	9,84	10,44	11,16	11,82	12,30	12,84	13,50	14,16	14,82	16,08	-
	Airflow	m^3/h	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	-	-
	Airflow	l/s	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	-	-
110.4	Fan RPM	rpm	1364	1372	1387	1408	1431	11451	1476	1496	1517	1540	1563	1583	1606	1627	-	-
	Sound pressure	dB(A)	89,4	89,4	89,4	89,4	89,6	89,9	90,1	90,4	90,6	90,9	90,9	90,8	90,8	90,9	-	-
	Total input	kW	8,76	9,00	9,42	9,96	10,62	11,16	11,94	12,60	13,26	14,04	14,64	15,24	15,90	16,50	-	-

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

Handling electric fan performance - Minimum airflow

Available static pressure (Pa) (supply+return)			90	100	120	150	180	210	240	270	300	330	360	390	420	450	510
	Airflow	m^3/h	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000
	Airflow	l/s	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111
49.4	Fan RPM	rpm	1032	1043	1060	1091	1120	1152	1180	1212	1239	1270	1297	1327	1354	1384	1439
	Sound pressure	dB(A)	79,6	79,7	80,0	80,4	80,9	81,0	81,0	81,0	81,1	81,1	81,3	81,8	82,3	82,7	83,6
	Total input	kW	2,09	2,17	2,31	2,56	2,81	3,06	3,27	3,51	3,72	3,99	4,25	4,53	4,80	5,10	5,73
	Airflow	m^3/h	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000
	Airflow	l/s	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111
54.4	Fan RPM	rpm	1032	1043	1060	1091	1120	1152	1180	1212	1239	1270	1297	1327	1354	1384	1439
	Sound pressure	dB(A)	79,6	79,7	80,0	80,4	80,9	81,0	81,0	81,0	81,1	81,1	81,3	81,8	82,3	82,7	83,6
	Total input	kW	2,09	2,17	2,31	2,56	2,81	3,06	3,27	3,51	3,72	3,99	4,25	4,53	4,80	5,10	5,73
	Airflow	m^3/h	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000
	Airflow	l/s	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056
60.4	Fan RPM	rpm	1029	1040	1057	1086	1118	1150	1178	1210	1238	1266	1296	1327	1353	1380	1439
	Sound pressure	dB(A)	80,7	80,8	81,1	81,6	82,1	82,1	82,1	82,1	82,2	82,2	82,6	83,0	83,5	84,0	84,9
	Total input	kW	2,79	2,89	3,07	3,38	3,75	4,04	4,32	4,68	4,96	5,28	5,64	6,04	6,40	6,76	7,60
	Airflow	m^3/h	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000
	Airflow	l/s	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056
70.4	Fan RPM	rpm	1029	1040	1057	1086	1118	1150	1178	1210	1238	1266	1296	1327	1353	1380	1439
	Sound pressure	dB(A)	80,7	80,8	81,1	81,6	82,1	82,1	82,1	82,1	82,2	82,2	82,6	83,0	83,5	84,0	84,9
	Total input	kW	2,79	2,89	3,07	3,38	3,75	4,04	4,32	4,68	4,96	5,28	5,64	6,04	6,40	6,76	7,60
	Airflow	m^3/h	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000
	Airflow	l/s	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056
80.4	Fan RPM	rpm	1029	1040	1057	1086	1118	1150	1178	1210	1238	1266	1296	1327	1353	1380	1439
	Sound pressure	dB(A)	80,7	80,8	81,1	81,6	82,1	82,1	82,1	82,1	82,2	82,2	82,6	83,0	83,5	84,0	84,9
	Total input	kW	2,79	2,89	3,07	3,38	3,75	4,04	4,32	4,68	4,96	5,28	5,64	6,04	6,40	6,76	7,60
	Airflow	m^3/h	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000
	Airflow	l/s	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556
90.4	Fan RPM	rpm	942	954	978	1011	1044	1080	1111	1146	1177	1211	1245	1274	1307	1335	1393
	Sound pressure	dB(A)	80,3	80,6	81,0	80,9	81,0	81,0	81,1	81,7	82,3	82,9	83,5	84,2	85,0	85,7	87,1
	Total input	kW	3,44	3,60	3,92	4,28	4,66	5,10	5,51	6,00	6,48	7,02	7,56	8,40	8,64	9,12	10,26
	Airflow	m^3/h	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000
	Airflow	l/s	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556
100.4	Fan RPM	rpm	942	954	978	1011	1044	1080	1111	1146	1177	1211	1245	1274	1307	1335	1393
	Sound pressure	dB(A)	80,3	80,6	81,0	80,9	81,0	81,0	81,1	81,7	82,3	82,9	83,5	84,2	85,0	85,7	87,1
	Total input	kW	3,44	3,60	3,92	4,28	4,66	5,10	5,51	6,00	6,48	7,02	7,56	8,40	8,64	9,12	10,26
	Airflow	m^3/h	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000
	Airflow	l/s	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556
110.4	Fan RPM	rpm	942	954	978	1011	1044	1080	1111	1146	1177	1211	1245	1274	1307	1335	1393
	Sound pressure	dB(A)	80,3	80,6	81,0	80,9	81,0	81,0	81,1	81,7	82,3	82,9	83,5	84,2	85,0	85,7	87,1
	Total input	kW	3,44	3,60	3,92	4,28	4,66	5,10	5,51	6,00	6,48	7,02	7,56	8,40	8,64	9,12	10,26

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

Prerformance

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
	Airflow	m^3/h	34000	34000	34000	34000	34000	34000	34000	34000	34000	-	-	-	-	-
	Airflow	l/s	9444	9444	9444	9444	9444	9444	9444	9444	9444	-	-	-	-	-
49.4	Fan RPM	rpm	1484	1493	1505	1527	1546	1567	1585	1603	1624	-	-	-	-	-
	Sound pressure	dB(A)	89,3	89,2	89,2	89,1	89,0	89,0	89,0	89,1	89,3	-	-	-	-	-
	Total input	kW	5,37	5,52	5,70	6,06	6,36	6,72	7,05	7,38	7,77	-	-	-	-	-
	Airflow	m^3/h	34000	34000	34000	34000	34000	34000	34000	34000	34000	-	-	-	-	-
	Airflow	l/s	9444	9444	9444	9444	9444	9444	9444	9444	9444	-	-	-	-	-
54.4	Fan RPM	rpm	1484	1493	1505	1527	1546	1567	1585	1603	1624	-	-	-	-	-
	Sound pressure	dB(A)	89,3	89,2	89,2	89,1	89,0	89,0	89,0	89,1	89,3	-	-	-	-	-
	Total input	kW	5,37	5,52	5,70	6,06	6,36	6,72	7,05	7,38	7,77	-	-	-	-	-
	Airflow	m^3/h	47000	47000	47000	47000	47000	47000	47000	-	-	-	-	-	-	-
	Airflow	l/s	13056	13056	13056	13056	13056	13056	13056	-	-	-	-	-	-	-
60.4	Fan RPM	rpm	1545	1552	1566	1586	1605	1625	1641	-	-	-	-	-	-	-
	Sound pressure	dB(A)	91,4	91,4	91,3	91,2	91,2	91,1	91,1	-	-	-	-	-	-	-
	Total input	kW	8,04	8,20	8,52	9,00	9,44	9,92	10,36	-	-	-	-	-	-	-
	Airflow	m^3/h	47000	47000	47000	47000	47000	47000	47000	-	-	-	-	-	-	-
	Airflow	l/s	13056	13056	13056	13056	13056	13056	13056	-	-	-	-	-	-	-
70.4	Fan RPM	rpm	1545	1552	1566	1586	1605	1625	1641	-	-	-	-	-	-	-
	Sound pressure	dB(A)	91,4	91,4	91,3	91,2	91,2	91,1	91,1	-	-	-	-	-	-	-
	Total input	kW	8,04	8,20	8,52	9,00	9,44	9,92	10,36	-	-	-	-	-	-	-
	Airflow	m^3/h	47000	47000	47000	47000	47000	47000	47000	-	-	-	-	-	-	-
	Airflow	l/s	13056	13056	13056	13056	13056	13056	13056	-	-	-	-	-	-	-
80.4	Fan RPM	rpm	1545	1552	1566	1586	1605	1625	1641	-	-	-	-	-	-	-
	Sound pressure	dB(A)	91,4	91,4	91,3	91,2	91,2	91,1	91,1	-	-	-	-	-	-	-
	Total input	kW	8,04	8,20	8,52	9,00	9,44	9,92	10,36	-	-	-	-	-	-	-
	Airflow	m^3/h	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000
	Airflow	l/s	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667
90.4	Fan RPM	rpm	1366	1371	1387	1410	1431	1454	1474	1497	1518	1541	1562	1585	1606	1627
	Sound pressure	dB(A)	89,4	89,4	89,4	89,4	89,6	89,9	90,1	90,4	90,6	90,9	90,9	90,8	90,8	90,9
	Total input	kW	8,82	8,94	9,36	10,02	10,62	11,28	11,88	12,60	13,26	14,04	14,64	15,30	15,84	16,50
	Airflow	m^3/h	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000
	Airflow	l/s	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667
100.4	Fan RPM	rpm	1366	1371	1387	1410	1431	1454	1474	1497	1518	1541	1562	1585	1606	1627
	Sound pressure	dB(A)	89,4	89,4	89,4	89,4	89,6	89,9	90,1	90,4	90,6	90,9	90,9	90,8	90,8	90,9
	Total input	kW	8,82	8,94	9,36	10,02	10,62	11,28	11,88	12,60	13,26	14,04	14,64	15,30	15,84	16,50
	Airflow	m^3/h	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000
	Airflow	l/s	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667
110.4	Fan RPM	rpm	1366	1371	1387	1410	1431	1454	1474	1497	1518	1541	1562	1585	1606	1627
	Sound pressure	dB(A)	89,4	89,4	89,4	89,4	89,6	89,9	90,1	90,4	90,6	90,9	90,9	90,8	90,8	90,9
	Total input	kW	8,82	8,94	9,36	10,02	10,62	11,28	11,88	12,60	13,26	14,04	14,64	15,30	15,84	16,50

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

High static pressure electric fan performance - Standard airflow

Available static pressure (Pa) (supply+return)			300	360	420	480	540	600	660	720	780	840	900	960	1020	1080	1140
	Airflow	m^3/h	26000	26000	26000	26000	26000	26000	26000	26000	26000	26000	26000	26000	26000	26000	26000
	Airflow	l/s	7222	7222	7222	7222	7222	7222	7222	7222	7222	7222	7222	7222	7222	7222	7222
49.4	Fan RPM	rpm	1550	1593	1638	1682	1727	1775	1817	1854	1900	1940	1981	2020	2055	2098	2136
	Sound pressure	dB(A)	94,4	94,2	94,2	94,4	94,8	95,1	95,4	95,7	96,1	96,4	96,8	97,2	97,5	97,9	98,3
	Total input	kW	5,37	5,91	6,51	7,08	7,68	8,37	9,00	9,60	10,38	11,07	11,73	12,42	13,05	13,99	14,61
	Airflow	m^3/h	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	-
	Airflow	l/s	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	-
54.4	Fan RPM	rpm	1673	1713	1753	1798	1833	1877	1917	1956	1995	2032	2070	2111	2147	2181	-
	Sound pressure	dB(A)	97,0	96,8	96,7	96,6	96,6	96,8	97,1	97,3	97,6	97,8	98,1	98,4	98,7	98,9	-
	Total input	kW	6,48	7,08	7,68	8,37	8,97	9,69	10,35	11,04	11,76	12,48	13,23	14,10	14,91	15,60	-
	Airflow	m^3/h	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000
	Airflow	l/s	9167	9167	9167	9167	9167	9167	9167	9167	9167	9167	9167	9167	9167	9167	9167
60.4	Fan RPM	rpm	1500	1548	1596	1643	1690	1732	1777	1821	1867	1907	1946	1991	2031	2069	2109
	Sound pressure	dB(A)	94,5	94,4	94,6	95,0	95,3	95,7	96,1	96,4	96,8	97,2	97,7	98,1	98,5	98,9	99,3
	Total input	kW	6,64	7,40	8,12	8,92	9,72	10,48	11,36	12,24	13,20	14,00	14,84	15,84	16,80	17,72	18,72
	Airflow	m^3/h	37000	37000	37000	37000	37000	37000	37000	37000	37000	37000	37000	37000	37000	37000	37000
	Airflow	l/s	10278	10278	10278	10278	10278	10278	10278	10278	10278	10278	10278	10278	10278	10278	10278
70.4	Fan RPM	rpm	1626	1668	1711	1750	1793	1835	1877	1918	1955	1995	2034	2067	2109	2147	2184
	Sound pressure	dB(A)	97,3	97,1	97,0	96,9	97,2	97,4	97,7	98,0	98,3	98,6	98,9	99,2	99,5	99,8	100,2
	Total input	kW	8,08	8,84	9,68	10,48	11,32	12,16	13,08	14,00	14,88	15,88	16,88	17,76	18,84	19,84	20,88
	Airflow	m^3/h	44000	44000	44000	44000	44000	44000	44000	44000	44000	44000	44000	-	-	-	-
	Airflow	l/s	12222	12222	12222	12222	12222	12222	12222	12222	12222	12222	12222	-	-	-	-
80.4	Fan RPM	rpm	1852	1889	1926	1962	1995	2031	2067	2102	2136	2171	2206	-	-	-	-
	Sound pressure	dB(A)	101,4	101,2	101,0	100,9	100,8	100,7	100,7	100,7	100,9	101,1	101,3	-	-	-	-
	Total input	kW	11,32	12,16	13,04	13,96	14,84	15,84	16,88	17,92	18,84	19,88	20,96	-	-	-	-
	Airflow	m^3/h	51000	51000	51000	51000	51000	51000	51000	51000	51000	51000	51000	51000	51000	51000	51000
	Airflow	l/s	14167	14167	14167	14167	14167	14167	14167	14167	14167	14167	14167	14167	14167	14167	14167
90.4	Fan RPM	rpm	1546	1592	1639	1685	1730	1771	1815	1858	1900	1942	1980	2018	2058	2100	2139
	Sound pressure	dB(A)	97,0	96,9	97,0	97,4	97,7	98,1	98,4	98,7	99,1	99,5	99,9	100,2	100,6	101,0	101,4
	Total input	kW	10,80	11,94	13,14	14,28	15,54	16,74	18,06	19,38	20,82	22,14	23,46	24,78	26,22	27,78	29,34
	Airflow	m^3/h	56000	56000	56000	56000	56000	56000	56000	56000	56000	56000	56000	56000	56000	56000	56000
	Airflow	l/s	15556	15556	15556	15556	15556	15556	15556	15556	15556	15556	15556	15556	15556	15556	15556
100.4	Fan RPM	rpm	1652	1695	1737	1779	1821	1860	1901	1942	1982	2018	2057	2093	2131	2171	2206
	Sound pressure	dB(A)	99,2	99,0	98,9	98,9	99,2	99,5	99,7	100,0	100,3	100,6	100,9	101,2	101,5	101,8	102,2
	Total input	kW	12,78	13,92	15,24	16,50	17,82	19,02	20,40	21,78	23,28	24,66	26,22	27,60	29,10	30,78	32,22
	Airflow	m^3/h	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	-	-
	Airflow	l/s	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	-	-
110.4	Fan RPM	rpm	1740	1780	1816	1856	1895	1935	1974	2010	2048	2086	2126	2160	2193	-	-
	Sound pressure	dB(A)	100,7	100,7	100,5	100,5	100,4	100,6	100,8	101,1	101,3	101,6	101,8	102,1	102,3	-	-
	Total input	kW	14,58	15,78	16,98	18,36	19,80	21,12	22,56	23,88	25,38	26,94	28,62	30,12	31,68	-	-

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

Prerformance

High static pressure electric fan performance - Minimum airflow

Available static pressure (Pa) (supply+return)			420	480	540	600	660	720	780	840	900	960	1020	1080	1140	1200	1260	1320
	Airflow	m^3/h	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000
	Airflow	l/s	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111
49.4	Fan RPM	rpm	1496	1545	1596	1642	1692	1737	1785	1828	1874	1919	1957	2000	2044	2081	2126	2161
	Sound pressure	dB(A)	91,3	91,9	92,3	92,8	93,3	93,9	94,4	94,9	95,4	96,0	96,5	97,0	97,6	98,2	98,7	99,2
	Total input	kW	5,19	5,70	6,30	6,87	7,47	8,01	8,64	9,27	9,93	10,65	11,25	11,94	12,63	13,26	14,07	14,70
	Airflow	m^3/h	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000
	Airflow	l/s	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111
54.4	Fan RPM	rpm	1496	1545	1596	1642	1692	1737	1785	1828	1874	1919	1957	2000	2044	2081	2126	2161
	Sound pressure	dB(A)	91,3	91,9	92,3	92,8	93,3	93,9	94,4	94,9	95,4	96,0	96,5	97,0	97,6	98,2	98,7	99,2
	Total input	kW	5,19	5,70	6,30	6,87	7,47	8,01	8,64	9,27	9,93	10,65	11,25	11,94	12,63	13,26	14,07	14,70
	Airflow	m^3/h	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000
	Airflow	l/s	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056
60.4	Fan RPM	rpm	1489	1542	1590	1644	1686	1732	1783	1826	1869	1914	1953	1994	2040	2080	2122	2164
	Sound pressure	dB(A)	92,6	93,0	93,5	94,0	94,5	95,1	95,6	96,2	96,7	97,2	97,8	98,4	99,0	99,5	100,1	100,6
	Total input	kW	6,84	7,60	8,32	9,16	9,84	10,60	11,52	12,32	13,16	14,08	14,88	15,72	16,72	17,64	18,60	19,64
	Airflow	m^3/h	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000
	Airflow	l/s	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056
70.4	Fan RPM	rpm	1489	1542	1590	1644	1686	1732	1783	1826	1869	1914	1953	1994	2040	2080	2122	2164
	Sound pressure	dB(A)	92,6	93,0	93,5	94,0	94,5	95,1	95,6	96,2	96,7	97,2	97,8	98,4	99,0	99,5	100,1	100,6
	Total input	kW	6,84	7,60	8,32	9,16	9,84	10,60	11,52	12,32	13,16	14,08	14,88	15,72	16,72	17,64	18,60	19,64
	Airflow	m^3/h	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000
	Airflow	l/s	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056
80.4	Fan RPM	rpm	1489	1542	1590	1644	1686	1732	1783	1826	1869	1914	1953	1994	2040	2080	2122	2164
	Sound pressure	dB(A)	92,6	93,0	93,5	94,0	94,5	95,1	95,6	96,2	96,7	97,2	97,8	98,4	99,0	99,5	100,1	100,6
	Total input	kW	6,84	7,60	8,32	9,16	9,84	10,60	11,52	12,32	13,16	14,08	14,88	15,72	16,72	17,64	18,60	19,64
	Airflow	m^3/h	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000
	Airflow	l/s	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556
90.4	Fan RPM	rpm	1418	1467	1523	1578	1627	1675	1726	1772	1821	1870	1910	1957	2000	2042	2086	2127
	Sound pressure	dB(A)	92,7	93,3	94,1	94,8	95,5	96,2	96,9	97,7	98,4	99,1	99,8	100,5	101,2	101,8	102,5	103,1
	Total input	kW	9,18	10,02	11,10	12,24	13,32	14,40	15,60	16,68	17,94	19,20	20,34	21,72	22,98	24,30	25,80	27,12
	Airflow	m^3/h	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000
	Airflow	l/s	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556
100.4	Fan RPM	rpm	1418	1467	1523	1578	1627	1675	1726	1772	1821	1870	1910	1957	2000	2042	2086	2127
	Sound pressure	dB(A)	92,7	93,3	94,1	94,8	95,5	96,2	96,9	97,7	98,4	99,1	99,8	100,5	101,2	101,8	102,5	103,1
	Total input	kW	9,18	10,02	11,10	12,24	13,32	14,40	15,60	16,68	17,94	19,20	20,34	21,72	22,98	24,30	25,80	27,12
	Airflow	m^3/h	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000
	Airflow	l/s	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556
110.4	Fan RPM	rpm	1418	1467	1523	1578	1627	1675	1726	1772	1821	1870	1910	1957	2000	2042	2086	2127
	Sound pressure	dB(A)	92,7	93,3	94,1	94,8	95,5	96,2	96,9	97,7	98,4	99,1	99,8	100,5	101,2	101,8	102,5	103,1
	Total input	kW	9,18	10,02	11,10	12,24	13,32	14,40	15,60	16,68	17,94	19,20	20,34	21,72	22,98	24,30	25,80	27,12

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

High static pressure electric fan performance - High airflow

Available static pressure (Pa) (supply+return)			240	300	360	420	480	540	600	660	720	780	840	900	960	1020
	Airflow	m^3/h	34000	34000	34000	34000	34000	34000	34000	34000	34000	34000	34000	-	-	-
	Airflow	l/s	9444	9444	9444	9444	9444	9444	9444	9444	9444	9444	9444	-	-	-
49.4	Fan RPM	rpm	1901	1884	1919	1956	1990	2026	2059	2095	2128	2164	2197	-	-	-
	Sound pressure	dB(A)	101,2	100,9	100,7	100,5	100,3	100,2	100,1	100,1	100,0	100,1	100,3	-	-	-
	Total input	kW	8,88	8,85	9,48	10,17	10,83	11,55	12,27	13,05	13,83	14,64	15,39	-	-	-
	Airflow	m^3/h	34000	34000	34000	34000	34000	34000	34000	34000	34000	34000	34000	-	-	-
	Airflow	l/s	9444	9444	9444	9444	9444	9444	9444	9444	9444	9444	9444	-	-	-
54.4	Fan RPM	rpm	1901	1884	1919	1956	1990	2026	2059	2095	2128	2164	2197	-	-	-
	Sound pressure	dB(A)	101,2	100,9	100,7	100,5	100,3	100,2	100,1	100,1	100,0	100,1	100,3	-	-	-
	Total input	kW	8,88	8,85	9,48	10,17	10,83	11,55	12,27	13,05	13,83	14,64	15,39	-	-	-
	Airflow	m^3/h	47000	47000	47000	47000	47000	47000	47000	47000	47000	-	-	-	-	-
	Airflow	l/s	13056	13056	13056	13056	13056	13056	13056	13056	13056	-	-	-	-	-
60.4	Fan RPM	rpm	1916	1949	1983	2019	2052	2086	2118	2153	2184	-	-	-	-	-
	Sound pressure	dB(A)	103,4	103,1	102,8	102,6	102,5	102,4	102,3	102,2	102,1	-	-	-	-	-
	Total input	kW	12,16	12,96	13,80	14,76	15,68	16,68	17,64	18,72	19,76	-	-	-	-	-
	Airflow	m^3/h	47000	47000	47000	47000	47000	47000	47000	47000	47000	-	-	-	-	-
	Airflow	l/s	13056	13056	13056	13056	13056	13056	13056	13056	13056	-	-	-	-	-
70.4	Fan RPM	rpm	1916	1949	1983	2019	2052	2086	2118	2153	2184	-	-	-	-	-
	Sound pressure	dB(A)	103,4	103,1	102,8	102,6	102,5	102,4	102,3	102,2	102,1	-	-	-	-	-
	Total input	kW	12,16	12,96	13,80	14,76	15,68	16,68	17,64	18,72	19,76	-	-	-	-	-
	Airflow	m^3/h	47000	47000	47000	47000	47000	47000	47000	47000	47000	-	-	-	-	-
	Airflow	l/s	13056	13056	13056	13056	13056	13056	13056	13056	13056	-	-	-	-	-
80.4	Fan RPM	rpm	1916	1949	1983	2019	2052	2086	2118	2153	2184	-	-	-	-	-
	Sound pressure	dB(A)	103,4	103,1	102,8	102,6	102,5	102,4	102,3	102,2	102,1	-	-	-	-	-
	Total input	kW	12,16	12,96	13,80	14,76	15,68	16,68	17,64	18,72	19,76	-	-	-	-	-
	Airflow	m^3/h	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000
	Airflow	l/s	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667
90.4	Fan RPM	rpm	1700	1739	1779	1817	1857	1895	1935	1972	2009	2049	2084	2123	2160	2195
	Sound pressure	dB(A)	101,1	100,8	100,7	100,5	100,5	100,4	100,6	100,8	101,1	101,3	101,6	101,8	102,1	102,3
	Total input	kW	13,38	14,52	15,78	17,04	18,42	19,74	21,18	22,50	23,88	25,38	26,88	28,50	30,12	31,74
	Airflow	m^3/h	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000
	Airflow	l/s	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667
100.4	Fan RPM	rpm	1700	1739	1779	1817	1857	1895	1935	1972	2009	2049	2084	2123	2160	2195
	Sound pressure	dB(A)	101,1	100,8	100,7	100,5	100,5	100,4	100,6	100,8	101,1	101,3	101,6	101,8	102,1	102,3
	Total input	kW	13,38	14,52	15,78	17,04	18,42	19,74	21,18	22,50	23,88	25,38	26,88	28,50	30,12	31,74
	Airflow	m^3/h	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000
	Airflow	l/s	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667
110.4	Fan RPM	rpm	1700	1739	1779	1817	1857	1895	1935	1972	2009	2049	2084	2123	2160	2195
	Sound pressure	dB(A)	101,1	100,8	100,7	100,5	100,5	100,4	100,6	100,8	101,1	101,3	101,6	101,8	102,1	102,3
	Total input	kW	13,38	14,52	15,78	17,04	18,42	19,74	21,18	22,50	23,88	25,38	26,88	28,50	30,12	31,74

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

Prerformance

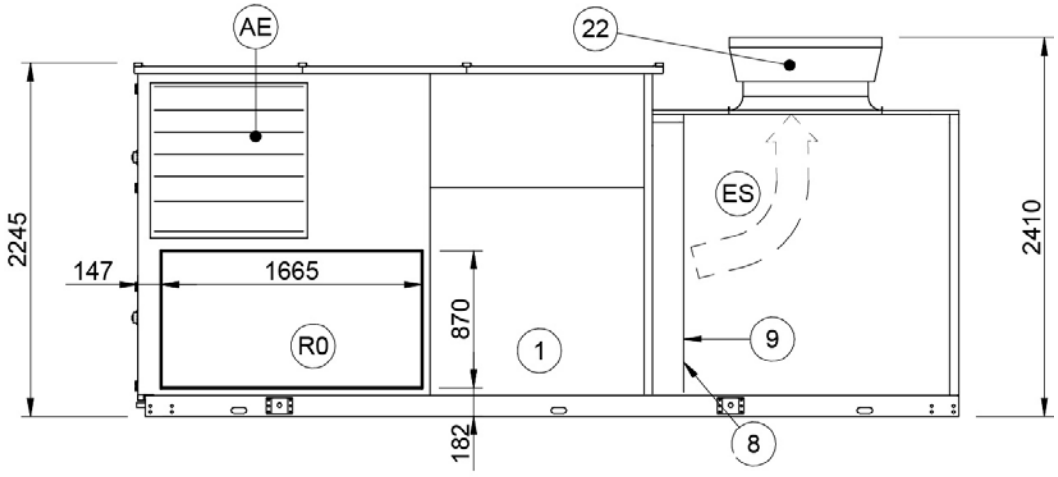
Exhaust electric fan performance

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

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

Size 49.4 - 54.4

DAA7V49.4_54.4 REV04
DATA/DATE 09/01/2019



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

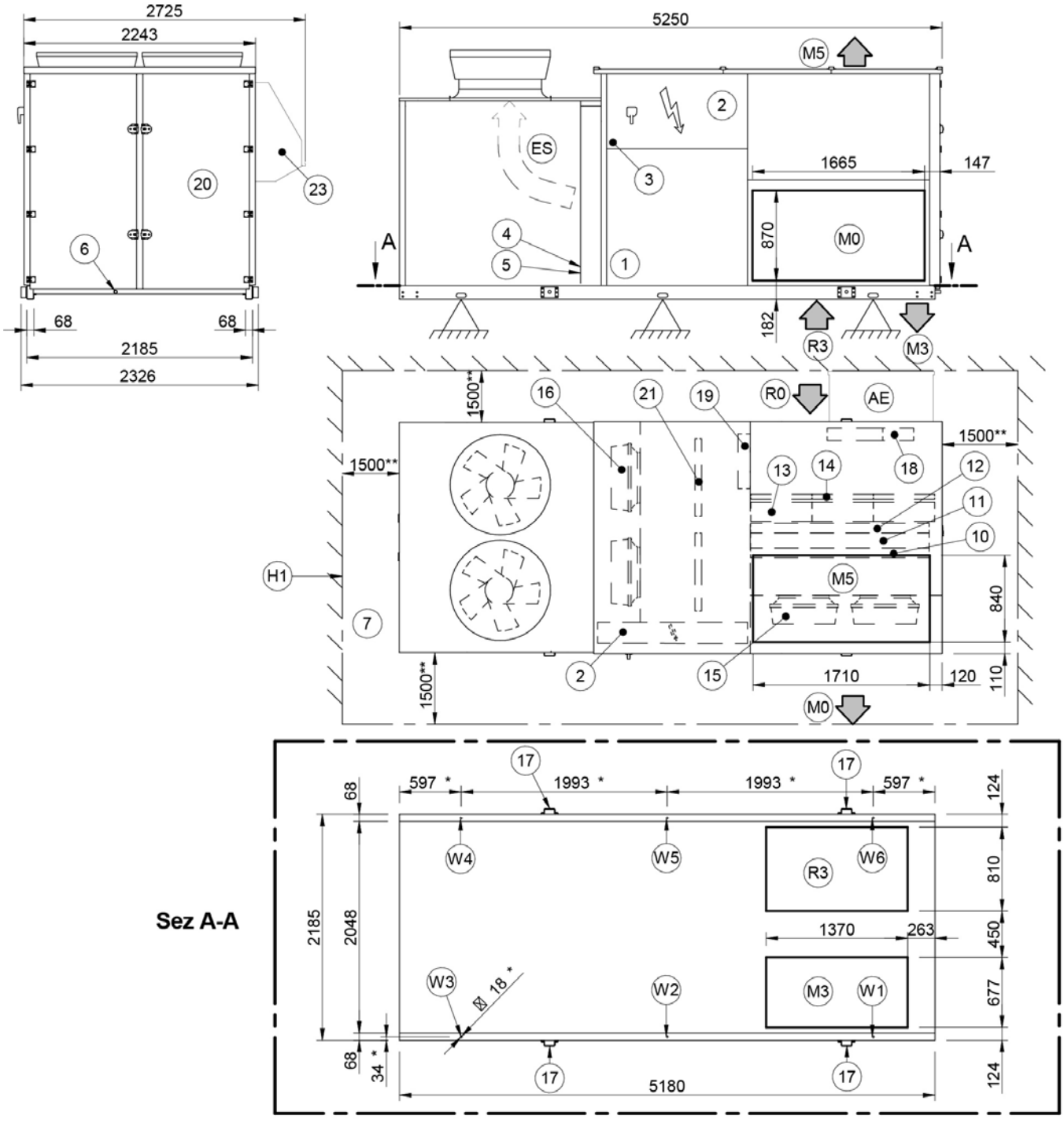
(R0) Horizontal air return
(R3) Downward air return (optional)
(M0) Horizontal air supply
(M3) Downward air supply (optional)
(M5) Upflow air supply
(AE) Outdoor air intake (CBK - CCK - CCKP version)
(ES) Exhaust air (CCK - CCKP version)
(H1) Wall with same height as unit on a maximum of three sides
(*) Anti-vibration mount position
(**) Suggested minimum clearance

WEIGHT DISTRIBUTION

SIZE		49.4			54.4		
Configuration		**CAK/CBK**	**CCK**	**CCKP**	**CAK/CBK**	**CCK**	**CCKP**
W1 Supporting point	kg	427	449	468	490	512	531
W2 Supporting point	kg	383	403	420	440	460	477
W3 Supporting point	kg	317	334	348	364	381	395
W4 Supporting point	kg	317	334	348	364	381	395
W5 Supporting point	kg	350	369	384	402	420	436
W6 Supporting point	kg	394	415	432	452	473	490
Operating weight	kg	2189	2304	2400	2512	2628	2724
Shipping weight	kg	2189	2304	2400	2512	2628	2724

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

Dimensional drawings

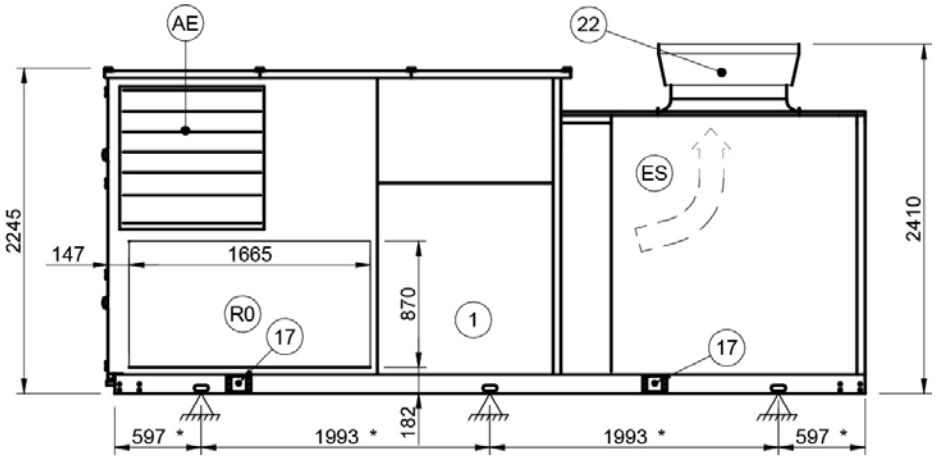


Sez A-A

Size 49.4 - 54.4 Combustion module

DAA7V49.4_54.4_GC09X-GC11X REV01
DATA/DATE 09/01/2019

Single chamber (GC09X 65 kW - GC10X 82 kW - GC11X 100 kW)



1. Compressor compartment
2. Electrical panel
3. Connector for keyboard or PC connection
4. Power input
5. Humidifier connections
6. Condensate drain
7. Functional spaces
8. Reheat coil (optional)
9. Treatment coil
10. F7 / Electronic filters (optional)
11. Standard G4 filters
12. Electric fan (supply - return)
13. Exhaust electric fan (CCK - CCKP version)
14. Lifting brackets (removable)
15. Outdoor air damper
16. Exhaust overpressure damper (CCK - CCKP version)
17. Access for coil - filter - heater inspection
18. Exhaust air recovery coil (only CCKP version)
19. Axitop (removable)
20. Gas module (to be connected to the unit during installation) (UNI ISO 228/1 - G 3/4")
21. Outdoor air return cap, accessory disassembled supplied

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

WEIGHT DISTRIBUTION

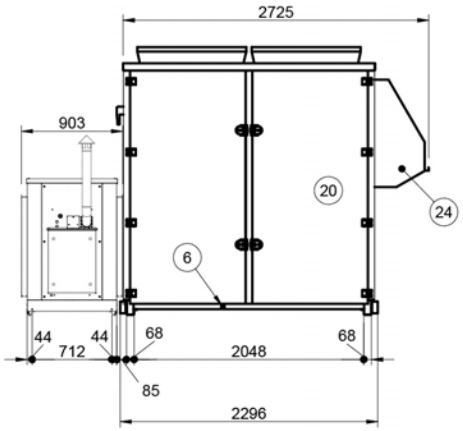
SIZE		49.4			54.4		
Configuration		**CAK/CBK**	**CCK**	**CCKP**	**CAK/CBK**	**CCK**	**CCKP**
W1 Supporting point	kg	427	449	468	490	512	531
W2 Supporting point	kg	383	403	420	440	460	477
W3 Supporting point	kg	317	334	348	364	381	395
W4 Supporting point	kg	317	334	348	364	381	395
W5 Supporting point	kg	350	369	384	402	420	436
W6 Supporting point	kg	394	415	432	452	473	490
Operating weight	kg	2189	2304	2400	2512	2628	2724
Shipping weight	kg	2189	2304	2400	2512	2628	2724

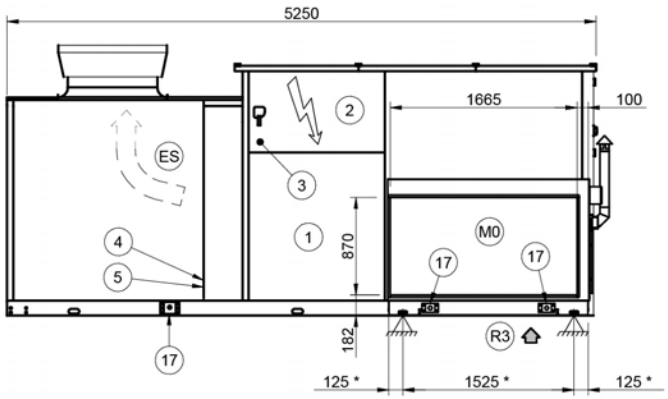
DISTRIBUZIONE PESI MODULO GAS

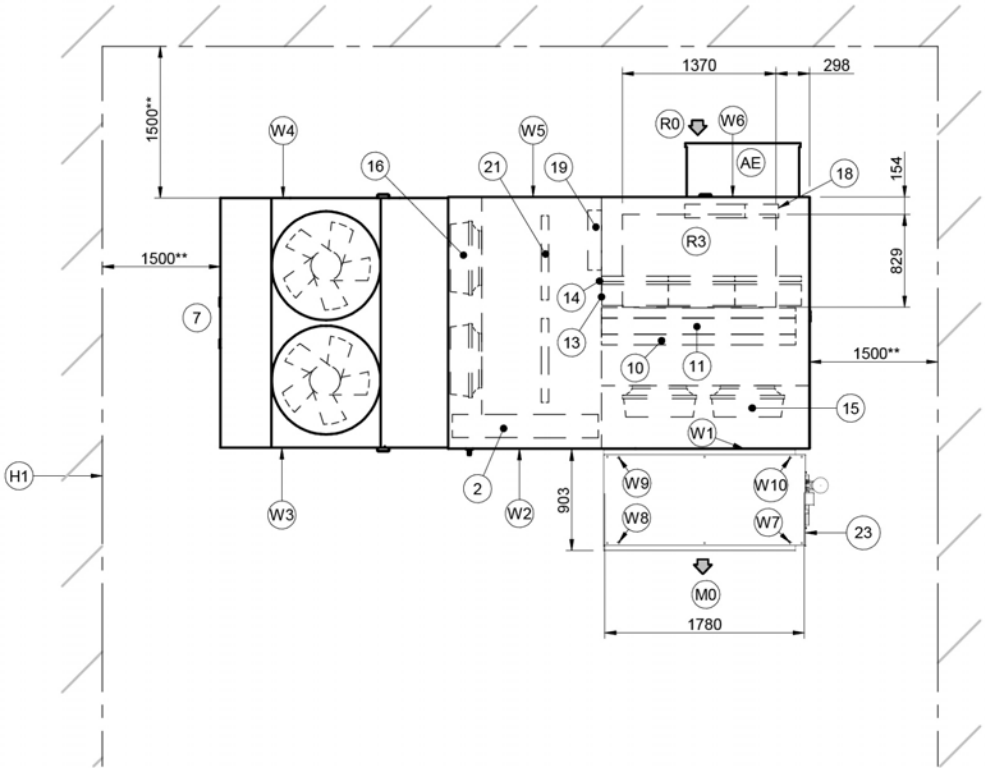
SIZE		49.4	54.4
W7 Supporting point	kg	75	75
W8 Supporting point	kg	65	65
W9 Supporting point	kg	65	65
W10 Supporting point	kg	75	75
Operating weight	kg	280	280
Shipping weight	kg	280	280

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

Dimensional drawings



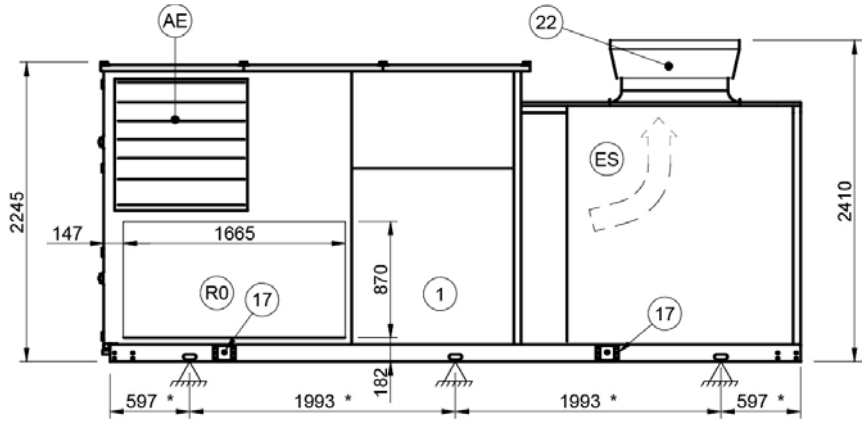




Size 49.4 - 54.4 Combustion module

Double chamber (GC12X 130 kW)

DAA7V49.4_54.4_GC12X REV01
DATA/DATE 09/01/2019



1. Compressor compartment
2. Electrical panel
3. Connector for keyboard or PC connection
4. Power input
5. Humidifier connections
6. Condensate drain
7. Functional spaces
8. Reheat coil (optional)
9. Treatment coil
10. F7 / Electronic filters (optional)
11. Standard G4 filters
12. Electric fan (supply - return)
13. Exhaust electric fan (CCK - CCKP version)
14. Lifting brackets (removable)
15. Outdoor air damper
16. Exhaust overpressure damper (CCK - CCKP version)
17. Access for coil - filter - heater inspection
18. Exhaust air recovery coil (only CCKP version)
19. Axitop (removable)
20. Gas module (to be connected to the unit during installation) (UNI ISO 228/1 - G 3/4")
21. Outdoor air return cap, accessory disassembled supplied

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

WEIGHT DISTRIBUTION

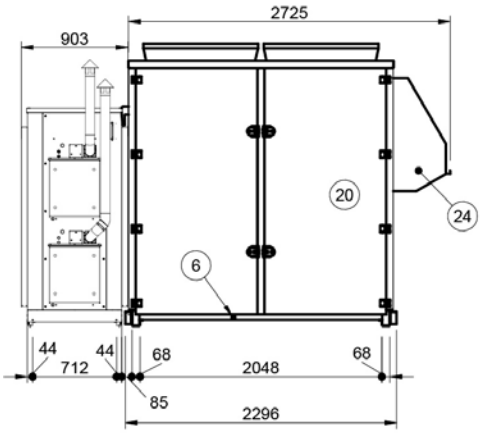
SIZE		49.4			54.4		
Configuration		**CAK/CBK**	**CCK**	**CCKP**	**CAK/CBK**	**CCK**	**CCKP**
W1 Supporting point	kg	427	449	468	490	512	531
W2 Supporting point	kg	383	403	420	440	460	477
W3 Supporting point	kg	317	334	348	364	381	395
W4 Supporting point	kg	317	334	348	364	381	395
W5 Supporting point	kg	350	369	384	402	420	436
W6 Supporting point	kg	394	415	432	452	473	490
Operating weight	kg	2189	2304	2400	2512	2628	2724
Shipping weight	kg	2189	2304	2400	2512	2628	2724

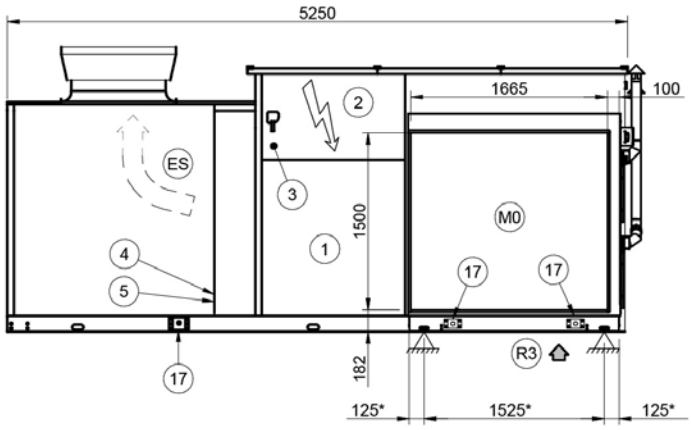
GAS MODULE WEIGHT DISTRIBUTION

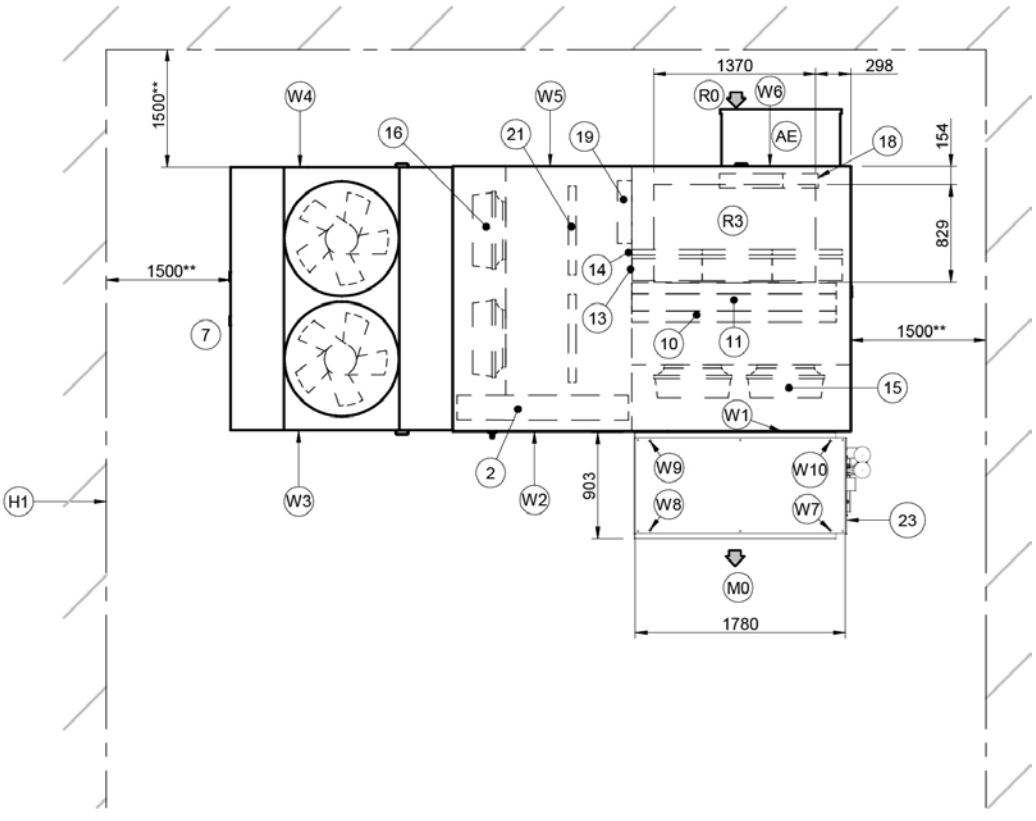
SIZE		49.4	54.4
W7 Supporting point	kg	100	100
W8 Supporting point	kg	75	75
W9 Supporting point	kg	75	75
W10 Supporting point	kg	100	100
Operating weight	kg	350	350
Shipping weight	kg	350	350

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

Dimensional drawings

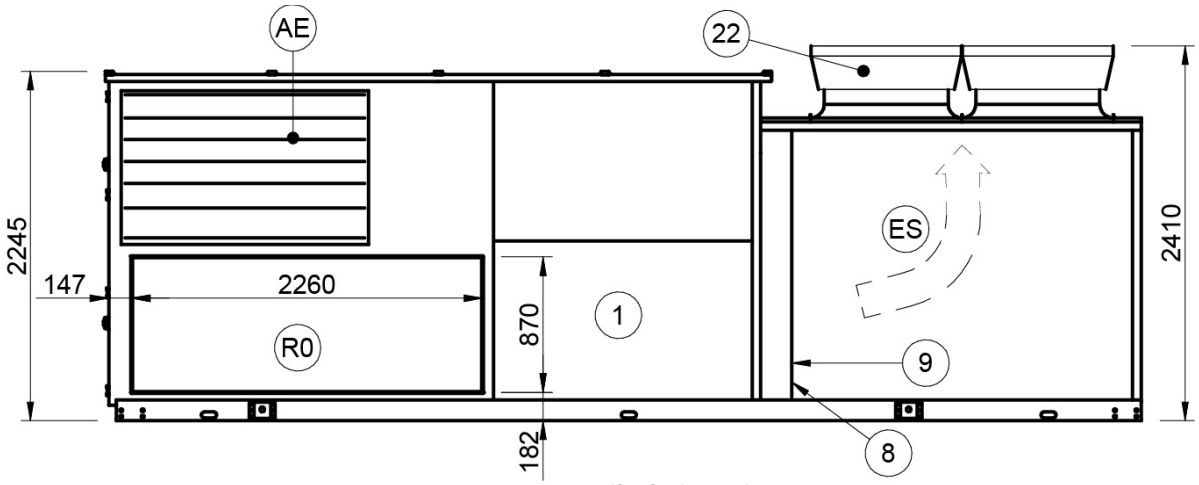






Size 60.4 - 70.4 - 80.4

DAA7V60.4_80.4 REV03
DATA/DATE 09/01/2019



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

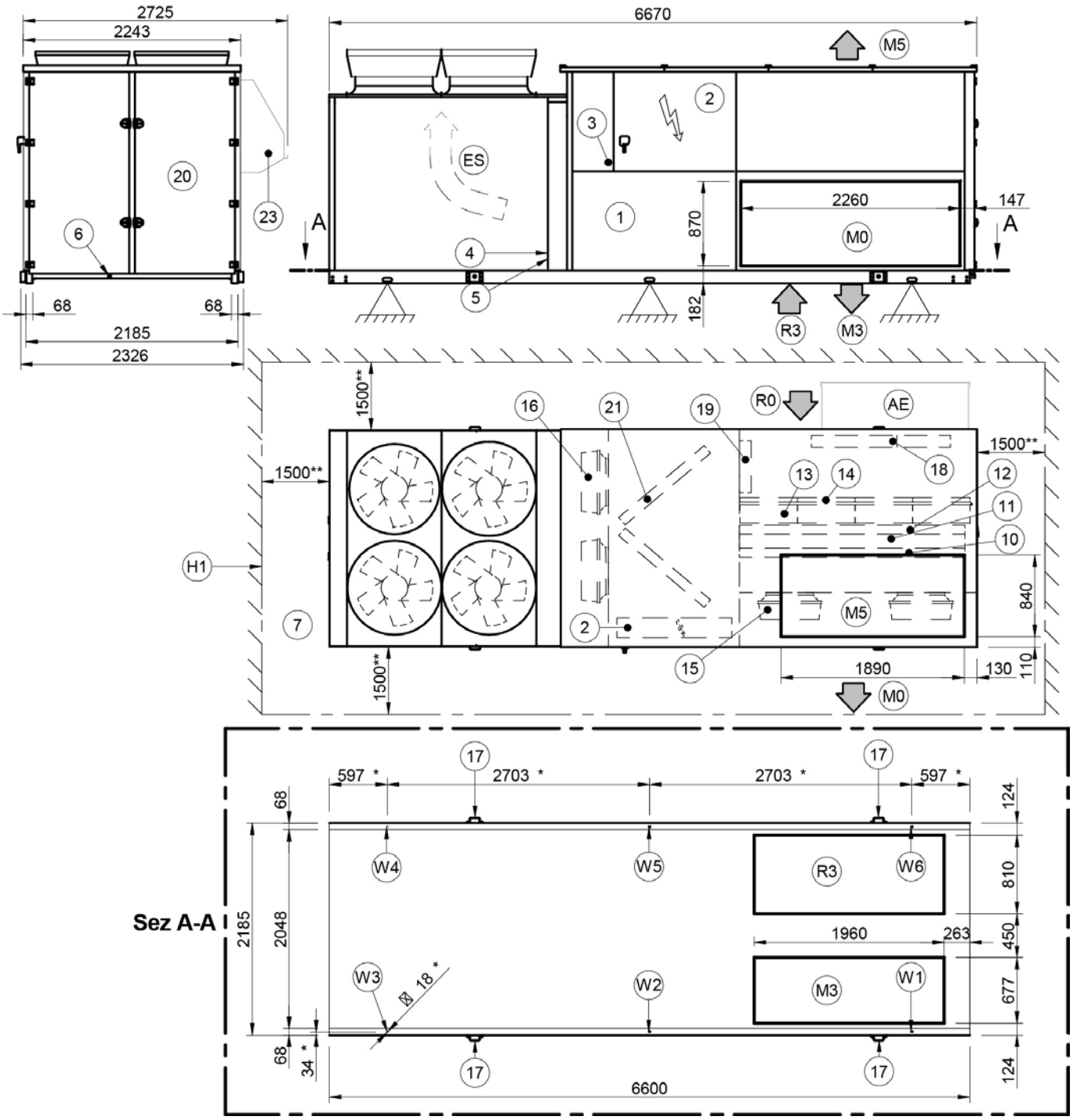
(R0) Horizontal air return
(R3) Downward air return (optional)
(M0) Horizontal air supply
(M3) Downward air supply (optional)
(M5) Upflow air supply
(AE) Outdoor air intake (CBK - CCK - CCKP version)
(ES) Exhaust air (CCK - CCKP version)
(H1) Wall with same height as unit on a maximum of three sides
(*) Anti-vibration mount position
(**) Suggested minimum clearance

WEIGHT DISTRIBUTION

SIZE		60.4			70.4			80.4		
Configuration		**CAK/CBK**	**CCK**	**CCKP**	**CAK/CBK**	**CCK**	**CCKP**	**CAK/CBK**	**CCK**	**CCKP**
W1 Supporting point	kg	524	554	578	562	591	616	644	674	699
W2 Supporting point	kg	470	497	519	504	530	553	578	605	627
W3 Supporting point	kg	390	412	430	418	440	458	479	501	520
W4 Supporting point	kg	390	412	430	418	440	458	479	501	520
W5 Supporting point	kg	430	454	475	461	485	505	529	553	573
W6 Supporting point	kg	484	511	534	518	546	568	595	622	645
Operating weight	kg	2688	2839	2966	2880	3031	3158	3305	3457	3583
Shipping weight	kg	2688	2839	2966	2880	3031	3158	3305	3457	3583

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

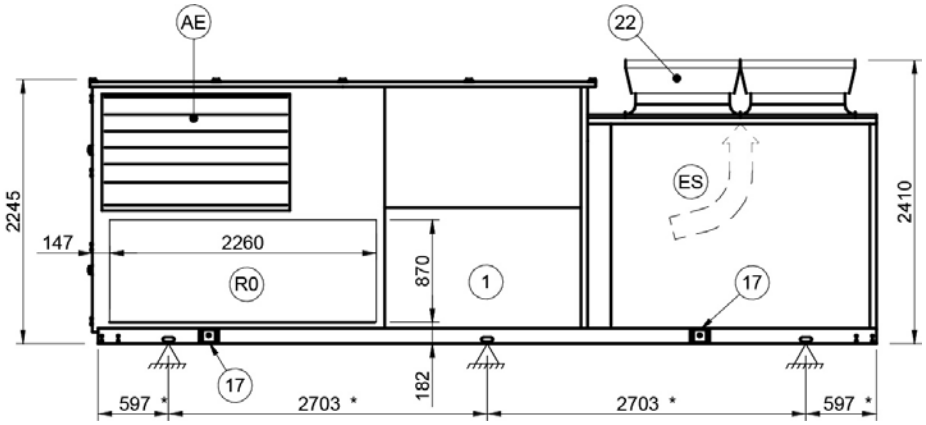
Dimensional drawings



Size 60.4 - 70.4 - 80.4 Combustion module

Single chamber (GC10X 82 kW - GC11X 100 kW)

DAA7V60.4_80.4_GC10X-GC11X REV01
DATA/DATE 09/01/2019



1. Compressor compartment
2. Electrical panel
3. Connector for keyboard or PC connection
4. Power input
5. Humidifier connections
6. Condensate drain
7. Functional spaces
8. Reheat coil (optional)
9. Treatment coil
10. F7 / Electronic filters (optional)
11. Standard G4 filters
12. Electric fan (supply - return)
13. Exhaust electric fan (CBK - CCK - CCKP version)
14. Lifting brackets (removable)
15. Outdoor air damper
16. Exhaust overpressure damper (CCK - CCKP version)
17. Access for coil - filter - heater inspection
18. Exhaust air recovery coil (only CCKP version)
19. Axitop (removable)
20. Gas module (to be connected to the unit during installation) (UNI ISO 228/1 - G 3/4")
21. Outdoor air return cap, accessory disassembled supplied

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

WEIGHT DISTRIBUTION

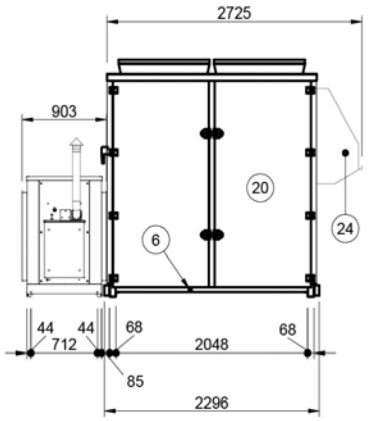
SIZE		60.4			70.4			80.4		
Configuration		**CAK/CBK**	**CCK**	**CCKP**	**CAK/CBK**	**CCK**	**CCKP**	**CAK/CBK**	**CCK**	**CCKP**
W1 Supporting point	kg	524	554	578	562	591	616	644	674	699
W2 Supporting point	kg	470	497	519	504	530	553	578	605	627
W3 Supporting point	kg	390	412	430	418	440	458	479	501	520
W4 Supporting point	kg	390	412	430	418	440	458	479	501	520
W5 Supporting point	kg	430	454	475	461	485	505	529	553	573
W6 Supporting point	kg	484	511	534	518	546	568	595	622	645
Operating weight	kg	2688	2839	2966	2880	3031	3158	3305	3457	3583
Shipping weight	kg	2688	2839	2966	2880	3031	3158	3305	3457	3583

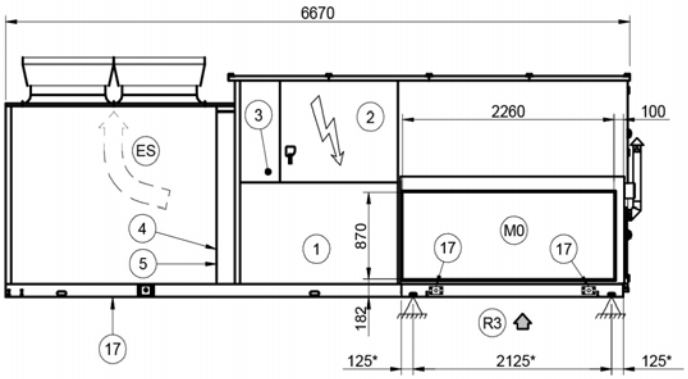
GAS MODULE WEIGHT DISTRIBUTION

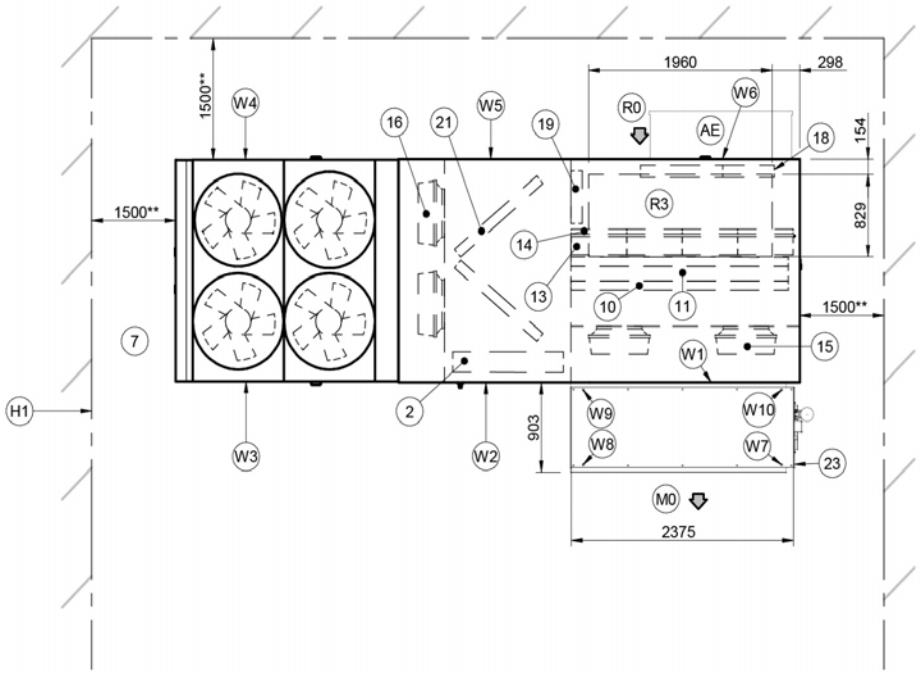
SIZE		60.4	70.4	80.4
W7 Supporting point	kg	85	85	85
W8 Supporting point	kg	75	75	75
W9 Supporting point	kg	75	75	75
W10 Supporting point	kg	85	85	85
Operating weight	kg	320	320	320
Shipping weight	kg	320	320	320

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

Dimensional drawings



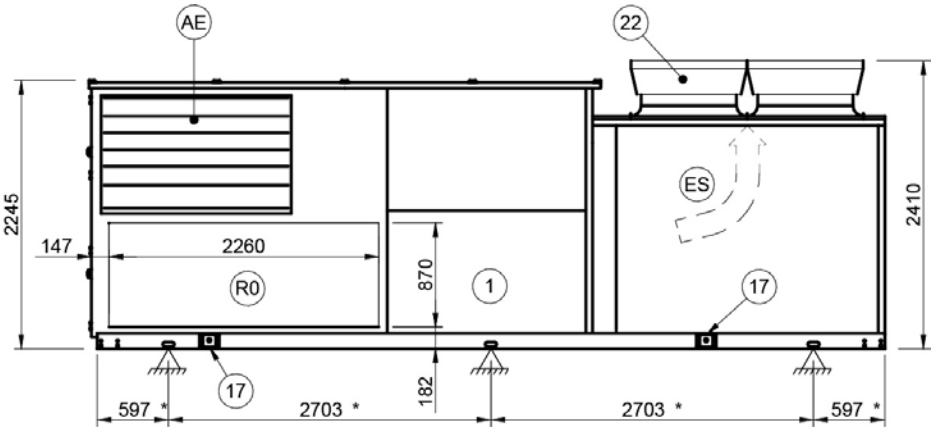




Size 60.4 - 70.4 - 80.4 Combustion module

Double chamber (GC13X 164 kW - GC06X 200 kW)

DAA7V60.4_80.4_GC13X-GC06X REV01
DATA/DATE 09/01/2019



1. Compressor compartment
2. Electrical panel
3. Connector for keyboard or PC connection
4. Power input
5. Humidifier connections
6. Condensate drain
7. Functional spaces
8. Reheat coil (optional)
9. Treatment coil
10. F7 / Electronic filters (optional)
11. Standard G4 filters
12. Electric fan (supply - return)
13. Exhaust electric fan (CBK - CCK - CCKP version)
14. Lifting brackets (removable)
15. Outdoor air damper
16. Exhaust overpressure damper (CCK - CCKP version)
17. Access for coil - filter - heater inspection
18. Exhaust air recovery coil (only CCKP version)
19. Axitop (removable)
20. Gas module (to be connected to the unit during installation) (UNI ISO 228/1 - G 1 1/2")
21. Outdoor air return cap, accessory disassembled supplied

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

WEIGHT DISTRIBUTION

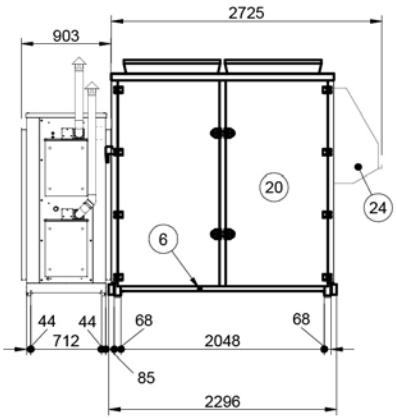
SIZE		60.4			70.4			80.4		
Configuration		**CAK/CBK**	**CCK**	**CCKP**	**CAK/CBK**	**CCK**	**CCKP**	**CAK/CBK**	**CCK**	**CCKP**
W1 Supporting point	kg	524	554	578	562	591	616	644	674	699
W2 Supporting point	kg	470	497	519	504	530	553	578	605	627
W3 Supporting point	kg	390	412	430	418	440	458	479	501	520
W4 Supporting point	kg	390	412	430	418	440	458	479	501	520
W5 Supporting point	kg	430	454	475	461	485	505	529	553	573
W6 Supporting point	kg	484	511	534	518	546	568	595	622	645
Operating weight	kg	2688	2839	2966	2880	3031	3158	3305	3457	3583
Shipping weight	kg	2688	2839	2966	2880	3031	3158	3305	3457	3583

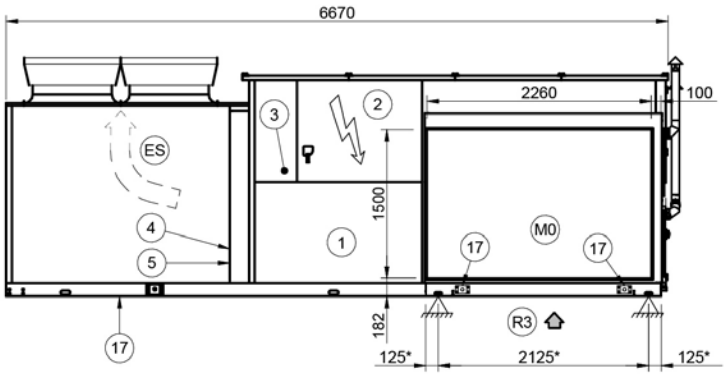
GAS MODULE WEIGHT DISTRIBUTION

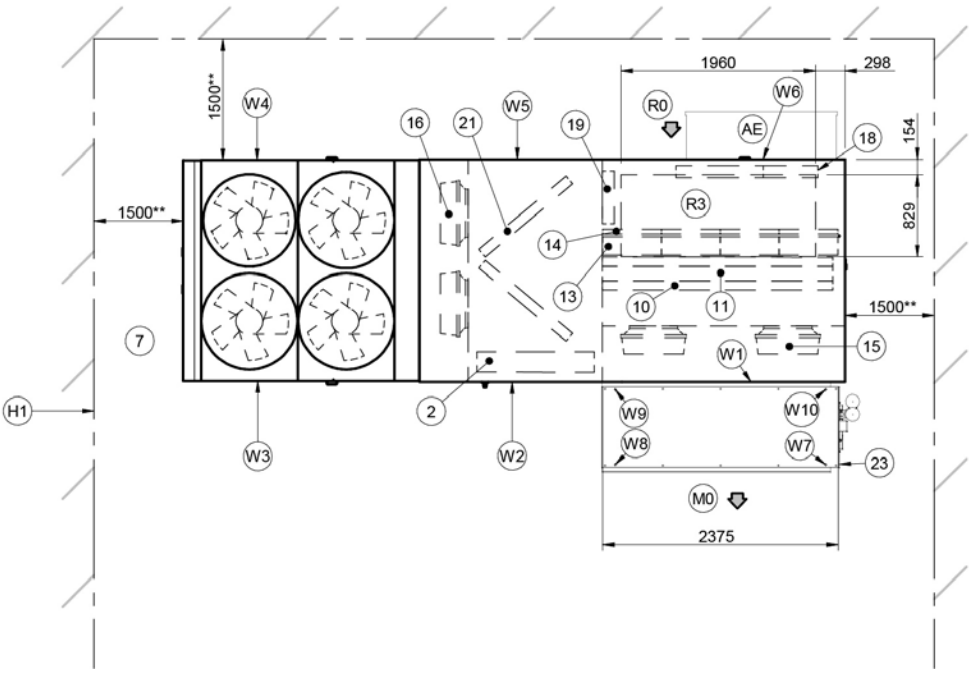
SIZE		60.4	70.4	80.4
W7 Supporting point	kg	145	145	145
W8 Supporting point	kg	100	100	100
W9 Supporting point	kg	145	145	145
W10 Supporting point	kg	100	100	100
Operating weight	kg	490	490	490
Shipping weight	kg	490	490	490

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

Dimensional drawings

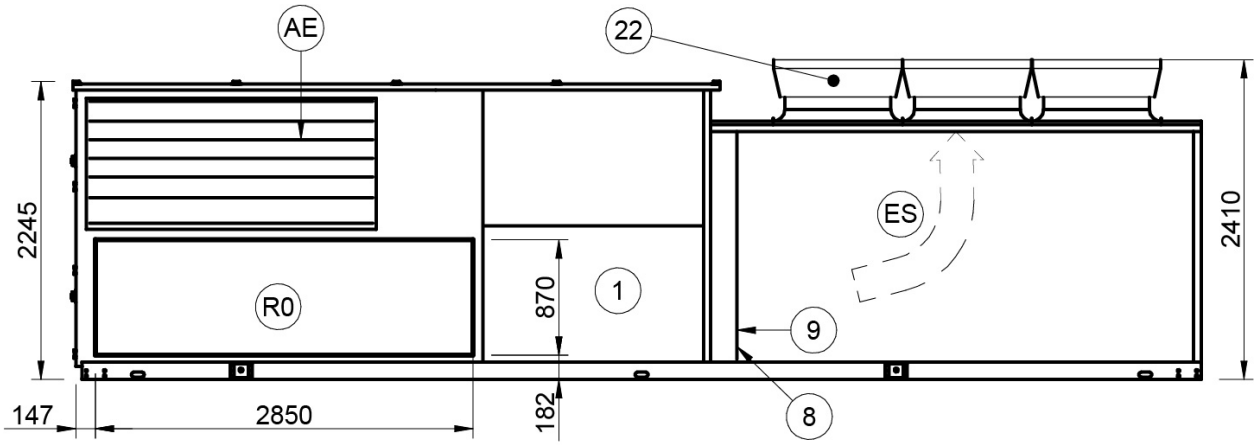






Size 90.4 - 100.4 - 110.4

DAA7V90.4_110.4 REV04
DATA/DATE 09/01/2019



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

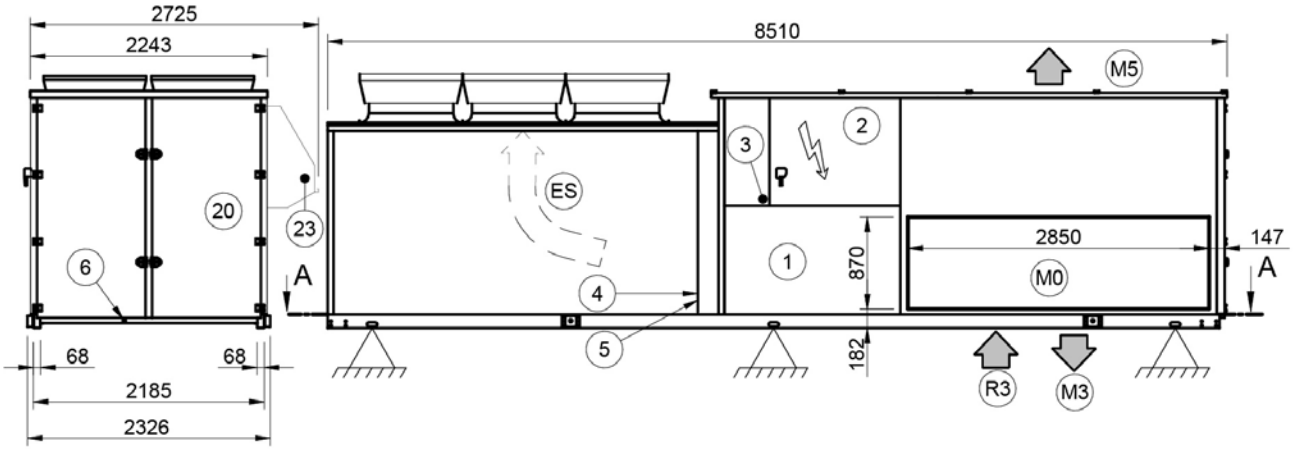
(R0) Horizontal air return
(R3) Downward air return
(M0) Horizontal air supply
(M3) Downward air supply (optional)
(M5) Upflow air supply (CBK - CCK - CCKP version)
(AE) Outdoor air intake
(ES) Exhaust air (CCK - CCKP version)
(H1) Wall with same height as unit on a maximum of three sides
(*) Anti-vibration mount position
(**) Suggested minimum clearance

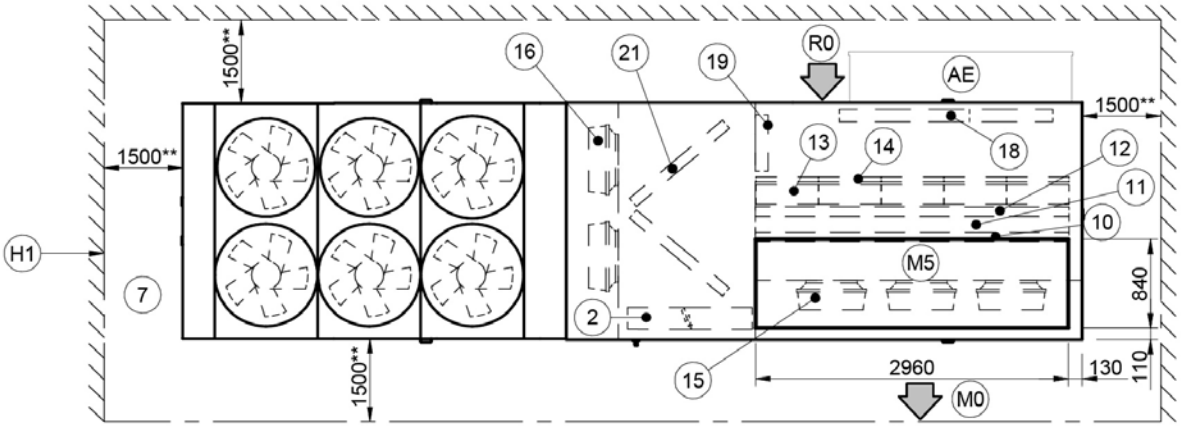
WEIGHT DISTRIBUTION

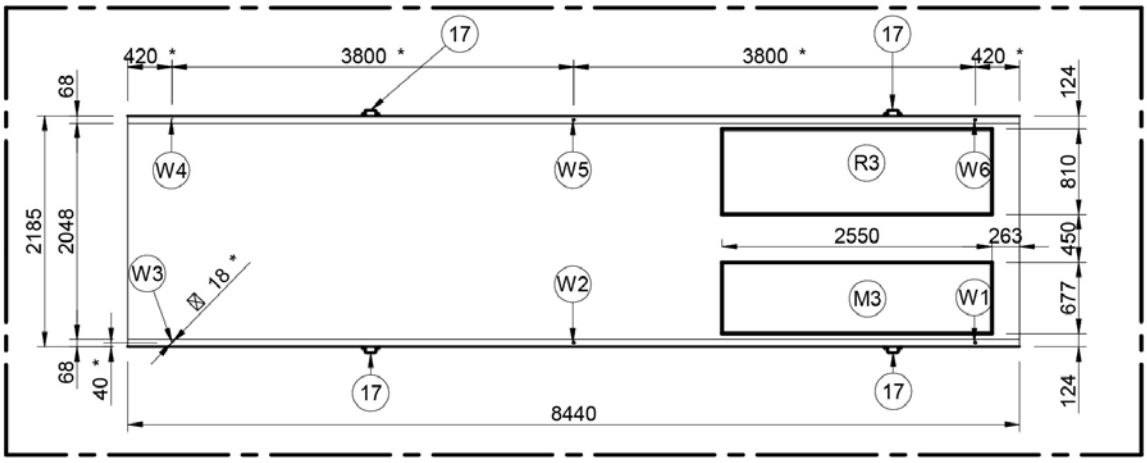
SIZE		90.4			100.4			110.4		
Configuration		**CAK/CBK**	**CCK**	**CCKP**	**CAK/CBK**	**CCK**	**CCKP**	**CAK/CBK**	**CCK**	**CCKP**
W1 Supporting point	kg	669	706	738	717	754	786	822	860	891
W2 Supporting point	kg	600	634	662	643	677	705	738	772	800
W3 Supporting point	kg	497	525	549	533	561	584	611	640	663
W4 Supporting point	kg	497	525	549	533	561	584	611	640	663
W5 Supporting point	kg	549	580	605	588	619	645	675	706	731
W6 Supporting point	kg	617	652	681	661	696	725	759	794	823
Operating weight	kg	3430	3622	3784	3674	3867	4029	4217	4411	4571
Shipping weight	kg	3430	3622	3784	3674	3867	4029	4217	4411	4571

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

Dimensional drawings



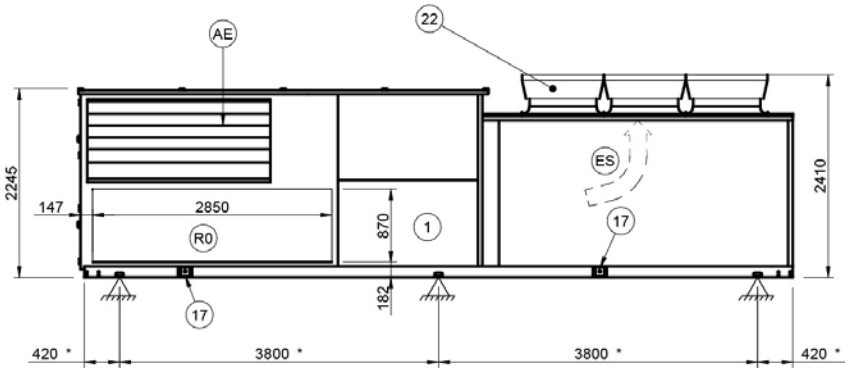




Size 90.4 - 100.4 - 110.4 Combustion module

Double chamber (GC12X 130 kW - GC13X 1640 kW - GC06X 200 kW)

DAA7V90.4_110.4_GC13X_GC06X REV02
DATA/DATE 09/01/2019



1. Compressor compartment
2. Electrical panel
3. Connector for keyboard or PC connection
4. Power input
5. Humidifier connections
6. Condensate drain
7. Functional spaces
8. Reheat coil (optional)
9. Treatment coil
10. F7 / Electronic filters (optional)
11. Standard G4 filters
12. Electric fan (supply - return)
13. Exhaust electric fan (CCK - CCKP version)
14. Lifting brackets (removable)
15. Outdoor air damper
16. Exhaust overpressure damper (CCK - CCKP version)
17. Access for coil - filter - heater inspection
18. Exhaust air recovery coil (only CCKP version)
19. Axitop (removable)
20. Gas module (to be connected to the unit during installation) (UNI ISO 228/1 - G 1 1/2")
21. Outdoor air return cap, accessory disassembled supplied

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

WEIGHT DISTRIBUTION

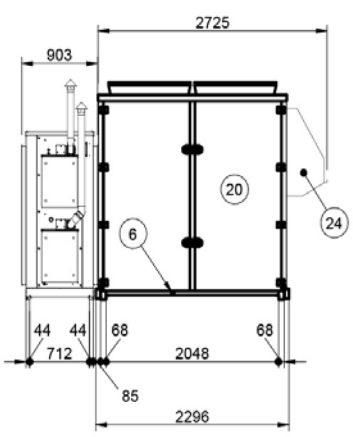
SIZE		90.4			100.4			110.4		
Configuration		**CAK/CBK**	**CCK**	**CCKP**	**CAK/CBK**	**CCK**	**CCKP**	**CAK/CBK**	**CCK**	**CCKP**
W1 Supporting point	kg	669	706	738	717	754	786	822	860	891
W2 Supporting point	kg	600	634	662	643	677	705	738	772	800
W3 Supporting point	kg	497	525	549	533	561	584	611	640	663
W4 Supporting point	kg	497	525	549	533	561	584	611	640	663
W5 Supporting point	kg	549	580	605	588	619	645	675	706	731
W6 Supporting point	kg	617	652	681	661	696	725	759	794	823
Operating weight	kg	3430	3622	3784	3674	3867	4029	4217	4411	4571
Shipping weight	kg	3430	3622	3784	3674	3867	4029	4217	4411	4571

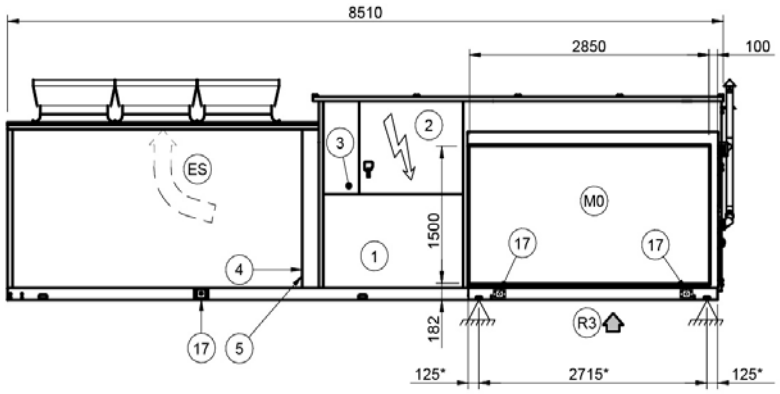
GAS MODULE WEIGHT DISTRIBUTION

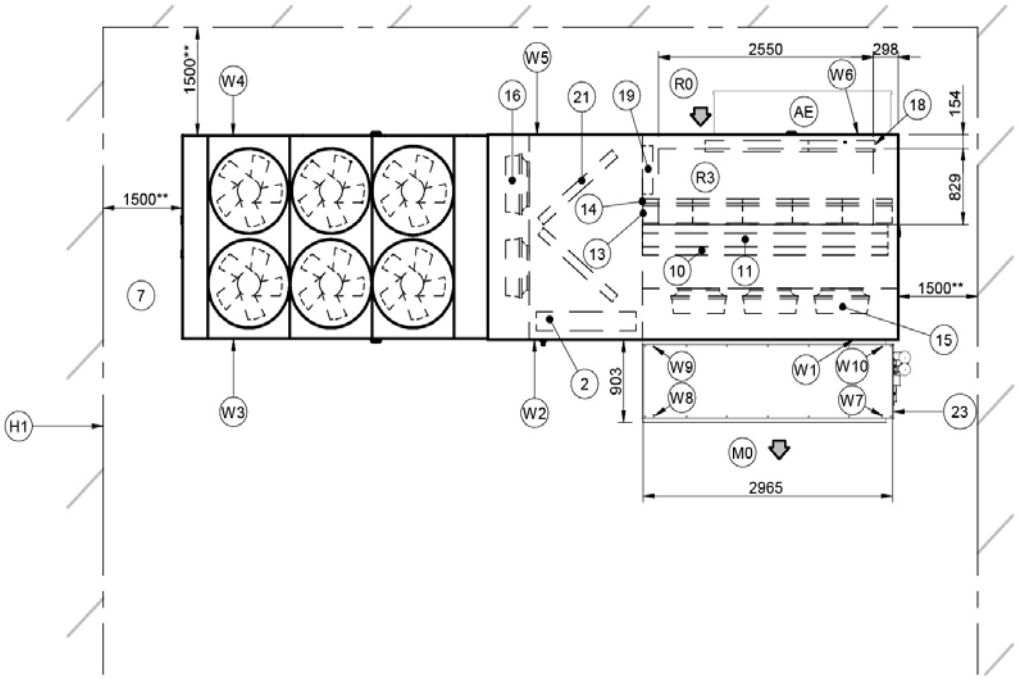
SIZE		90.4	100.4	110.4
W7 Supporting point	kg	155	155	155
W8 Supporting point	kg	110	110	110
W9 Supporting point	kg	110	110	110
W10 Supporting point	kg	155	155	155
Operating weight	kg	530	530	530
Shipping weight	kg	530	530	530

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

Dimensional drawings



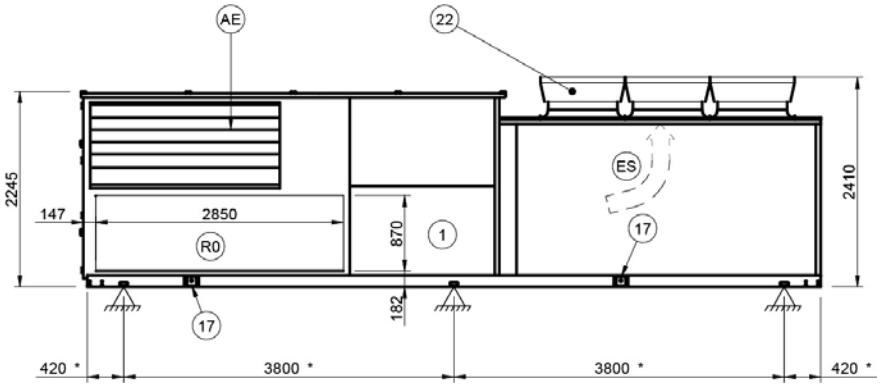




Size 90.4 - 100.4 - 110.4 Combustion module

Triple chamber (GC07X 300 kW)

DAA7V90.4_110.4_GC07X REV02
DATA/DATE 09/01/2019



1. Compressor compartment
2. Electrical panel
3. Connector for keyboard or PC connection
4. Power input
5. Humidifier connections
6. Condensate drain
7. Functional spaces
8. Reheat coil (optional)
9. Treatment coil
10. F7 / Electronic filters (optional)
11. Standard G4 filters
12. Electric fan (supply - return)
13. Exhaust electric fan (CCK - CCKP version)
14. Lifting brackets (removable)
15. Outdoor air damper
16. Exhaust overpressure damper (CCK - CCKP version)
17. Access for coil - filter - heater inspection
18. Exhaust air recovery coil (only CCKP version)
19. Axitop (removable)
20. Gas module (to be connected to the unit during installation) (UNI ISO 228/1 - 1xG 1 1/2" and 1xG 3/4")
21. Outdoor air return cap, accessory disassembled supplied

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

WEIGHT DISTRIBUTION

SIZE		90.4			100.4			110.4		
Configuration		**CAK/CBK**	**CCK**	**CCKP**	**CAK/CBK**	**CCK**	**CCKP**	**CAK/CBK**	**CCK**	**CCKP**
W1 Supporting point	kg	669	706	738	717	754	786	822	860	891
W2 Supporting point	kg	600	634	662	643	677	705	738	772	800
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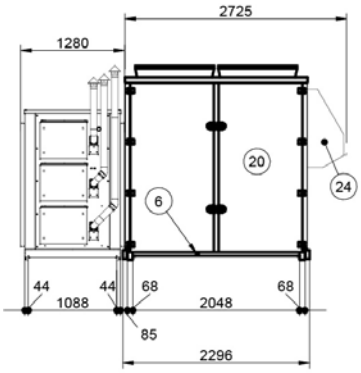
W5 Supporting point	kg	549	580	605	588	619	645	675	706	731
W6 Supporting point	kg	617	652	681	661	696	725	759	794	823
Operating weight	kg	3430	3622	3784	3674	3867	4029	4217	4411	4571
Shipping weight	kg	3430	3622	3784	3674	3867	4029	4217	4411	4571

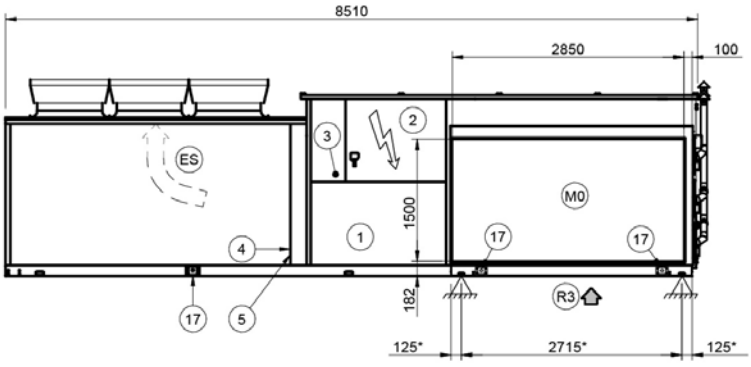
GAS MODULE WEIGHT DISTRIBUTION

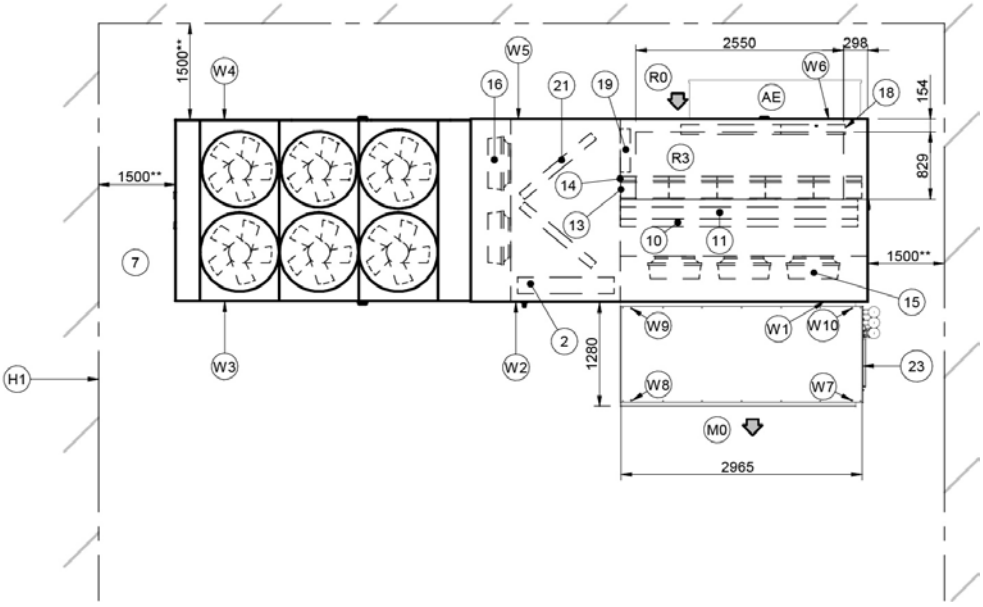
SIZE		90.4	100.4	110.4
W7 Supporting point	kg	190	190	190
W8 Supporting point	kg	165	165	165
W9 Supporting point	kg	165	165	165
W10 Supporting point	kg	190	190	190
Operating weight	kg	710	710	710
Shipping weight	kg	710	710	710

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

Dimensional drawings







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