Packaged rooftop air conditioner full fresh air

CLIVETPACK² FFA

CSRN-XHE2 FFA 16.2-24.4 RANGE

TECHNICAL BULLETIN



R-410A

SIZE	16.2	20.4	22.4	24.4
COOLING CAPACITY kW	49,5	76,1	83,4	90,4
HEATING CAPACITY kW	50,0	73,2	81,4	89,5

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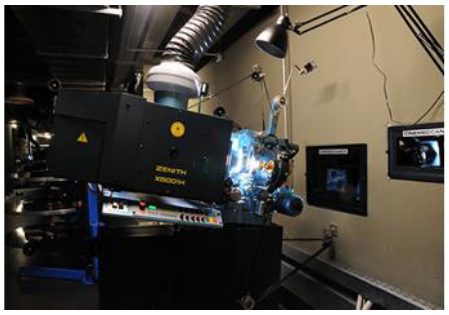
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Features

Specific applications require the continuous intake of full fresh air

In commercial and industrial food services, fumes and vapours are discharged from the cooking area through extraction hoods. For proper operation, they require the simultaneous introduction of the same quantity of exhaust air. This air must be suitably filtered and handled to guarantee that it complies with hygienic requirements and ensures the users comfort and therefore their productivity.
This same requirement also applies to other different final destination. Specific extractors are installed in the projection corridors in multiplex cinemas, which cool the powerful and expensive projector lamps. You can find the same type of operation in photographc laboratories.
In other situations, hygienic and normative requirements require the continuous operation with full fresh air. For example, in the smoking areas and chemical laboratories.







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

All units can be integrated with a broad range of accessories that customise the product according to the application.

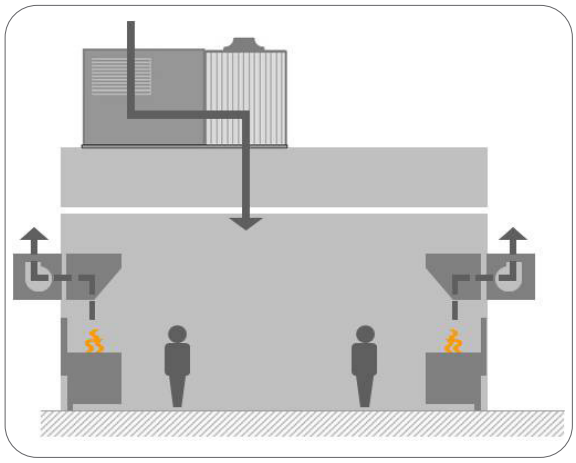
- ✓ Independent dual refrigeration circuit with two scroll compressors connected in parallel that allow more partialisation steps per circuit (size 16.2 single scroll compressor per circuit)
- ✓ Radial fans directly coupled to EC brushless motors (plug fans) permit control of the airflow for adapting to the characteristics of the aeraulic system. On both the supply and the exhaust section when present.
- ✓ Filtration of air in several stages, from coarse particles (G4 filters) to classes of absolute filtration (electronic filters).
- ✓ Constant supply of airflow even with continuous clogging of the filters.
- ✓ 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.

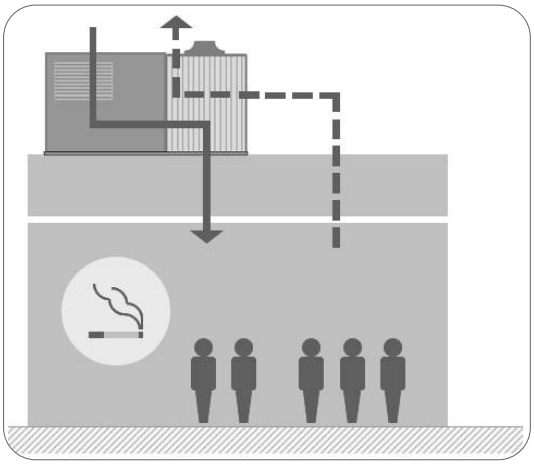
CLIVETPACK^2 FFA is the industrialised direct expansion solution of Clivet for full fresh air conditioning

Thousands rooftop CLIVETPACK units have been already installed successfully for medium and high attendance environments, such as shopping centres and multiplex cinemas. Clivet offers CLIVETPACK^2 FFA, a unit:

- industrialised, designed according to the criteria of total quality and individually tested before shipping;
- full fresh air thanks to an innovative direct expansion circuit with reversible heat pump;
- able to treat only intake air or also extraction and discharge, without contamination between the air flows;
- high energy efficiency, for the reduction of the annual operating costs and of the environmental impact.



Only intake version

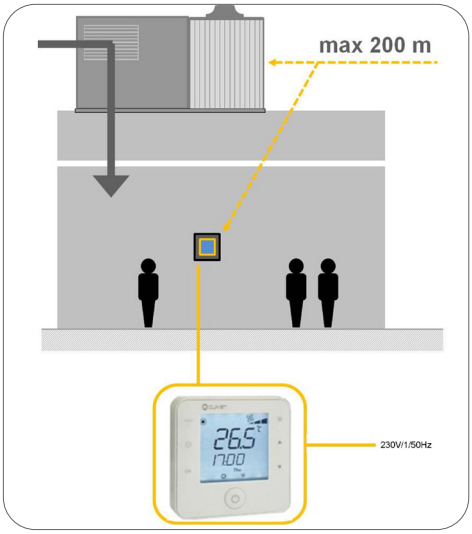


Intake and exhaust version

Continuous control of the comfort in the served environment

The effective temperature and humidity conditions in the served zone are detected by CLIVETPACK^2 FFA with an ambient sensor. 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.



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.

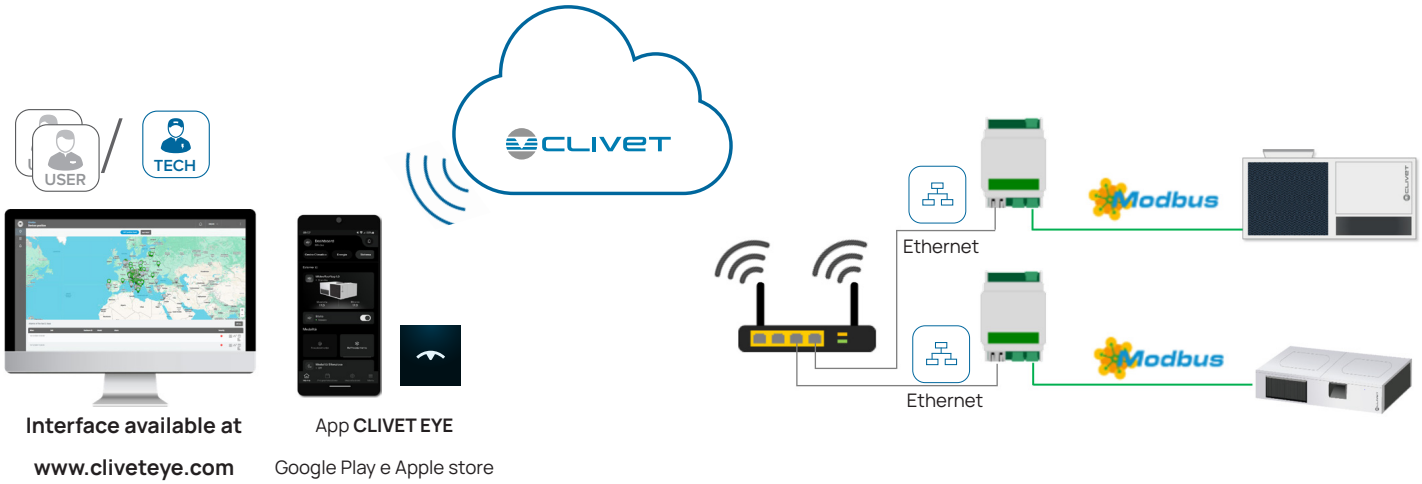




Features

IOTI Industrial IoT module for functions and services on cloud base

This device allows access to the unit's cloud supervision system through the Clivet EYE application and the Web platform www.clive-teye.com.



Through the IOTI module and using the Modbus RS485 port, it is possible to monitor and remotely manage the main operating parameters of the unit. Supervision is available with a USER or TECH license and is valid for 10 years from installation with the possibility of renewal. In addition to the features available for the USER license, the TECH one allows for a more in-depth view of the operating status and remote resetting of any anomalies (Contact Clivet for the activation request).

Among the main functions and for all monitored units, the two licenses allow you to:

- View the main operating parameters (1) 💻 / 📱
- Turn the unit on and off 💻 / 📱
- View any anomalies and alarm history (reset only available with TECH license) 💻 / 📱
- Create graphs with the trend of the main system variables (2) 💻 / 📱
- Program a weekly schedule on an hourly basis (3) 💻 / 📱
- Consult consumption data if a dedicated option is provided 💻 / 📱
- View the geographical map of the supervised units 💻



⚠ The IoT module must be configured for each unit for which remote monitoring is planned.
⚠ Internet connection provision via Ethernet by the Customer.
⚠ Installation by the Customer.
⚠ Maximum unit distance – IOTI: 1000m; IOTI - router: 100m;

For further information, consult the dedicated Technical Bulletin.

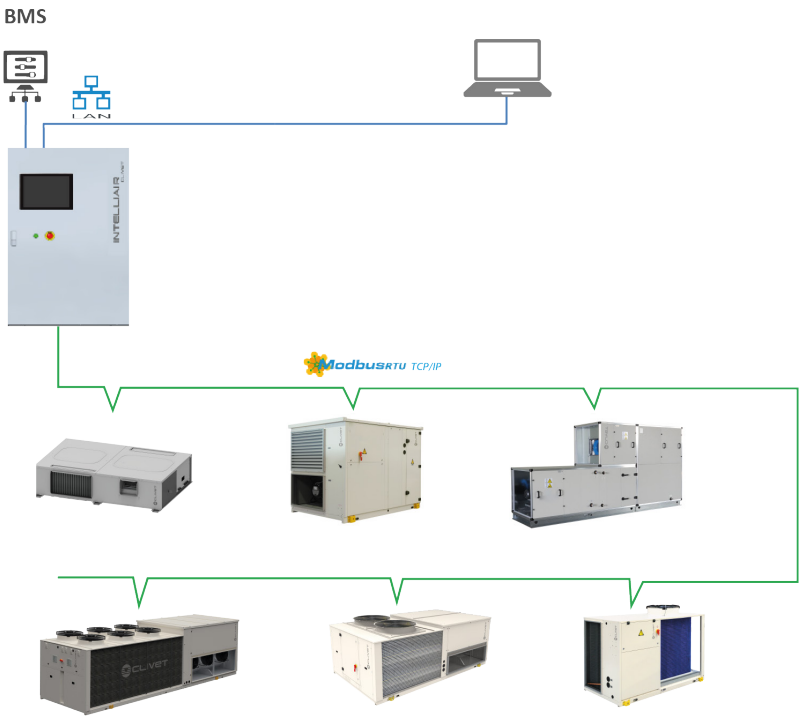
Advanced system management: INTELLIAIR

INTELLIAIR is Clivet›s specialized solution for the supervision and control of the air conditioning system in all applications where comfort and energy efficiency are of primary importance. Inetegrated with Rooftops and ventilation units, it ensure maximum confort of the served environments with minimum consumption.

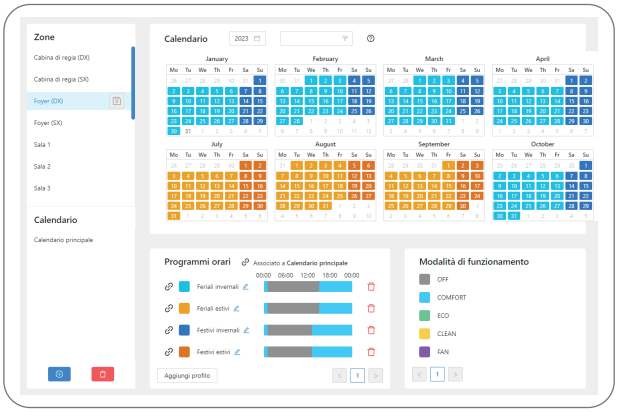
Communication between INTELLIAIR, Clivet air conditioning units and field devices is carried out via serial cable RS-485 with Modbus RTU communication protocol or with Ethernet cable for units that communicate in Modbus TCP/IP.

Some of its main functions are:

- General control of the building and individual areas via schematic system diagram
- Display of units' operating mode as well as alarms and maintenance status
- Modification of area operating parameters such as room temperature setpoint, relative humidity and air quality
- Display of room variable trends over the last 12 hours
- Hourly scheduling of the areas on a daily and annual basis







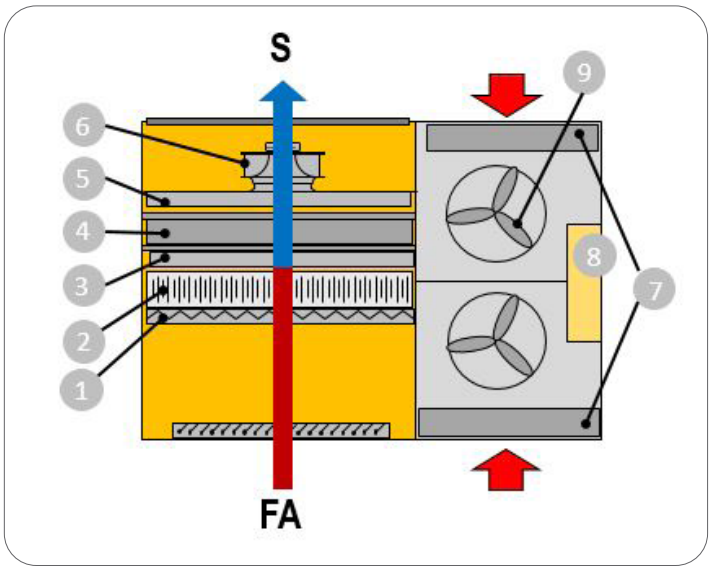
*shown above are some INTELLIAIR management interface screens: Schematic system diagram and Area programming

Refer to the specific Technical Bulletin for more information.

Features

CBFFA - Configuration for outdoor air intake

CLIVETPACK^2 FFA have all the components for system operation. In the standard configuration, the fresh air is filtered and treated by the direct expansion coil and then intake into the area to be air conditioned. The control is completely automatic and is based both on the conditions measured by the standard supplied room probe, as well as on the fresh air conditions. Also the FREE-COOLING function is activated automatically: the served area is cooled without activating the compressors.

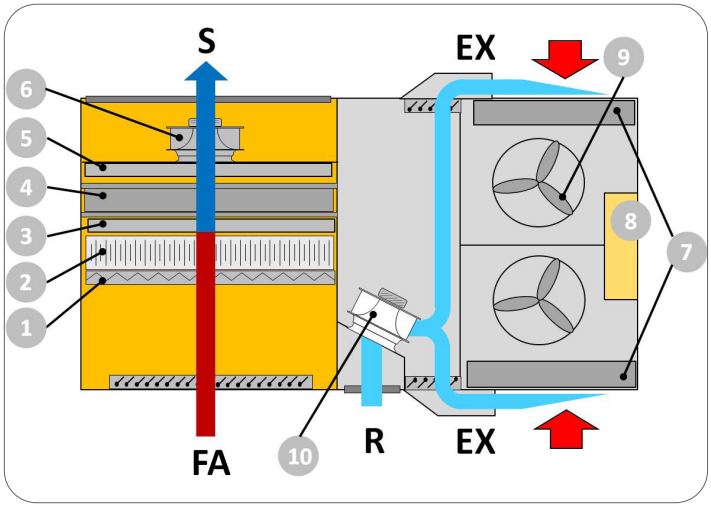


FA. Fresh air
S. Treated air supply

1. First filtration stage efficiency (G4 efficiency)
2. Second filtration stage (optional): F7 high efficiency filter, F9 high efficiency filter, electronic (E10 equivalent efficiency)
3. Heating with water coil or electric heaters (optional)
4. Exchanger for air handling
5. Hot gas post-heating (optional)
6. Supply fan section
7. Source side exchanger
8. Electrical panel
9. External fan section

CCFFA - Configuration for outdoor air intake with extraction and exhaust

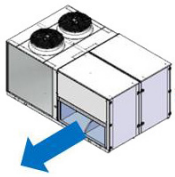
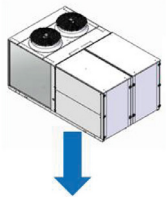
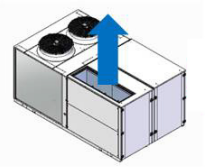
CLIVETPACK^2 FFA is also available in optional configuration featuring a section of air extraction from the served area and exhaust outside.
The intake and extracted air flow are completely separated by a steel wall. The exhaust air is used by the thermodynamic energy recovery system: this increases the seasonal production efficiency of the direct expansion circuit, without extensive load losses typical of static or rotary traditional recuperators. With this version it is easy to wash the source side exchanger from the outside. However, it is necessary to check that the extracted air does not contain any pollutants capable of damaging the unit, such as acids, saline solutions, high temperature fumes, etc.

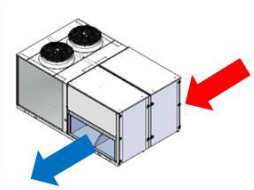
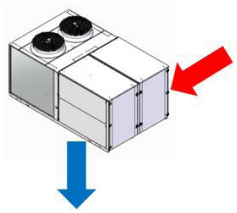
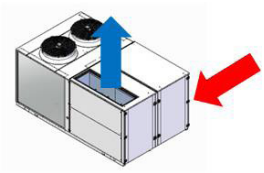
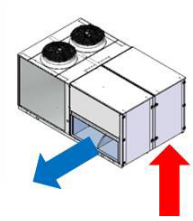
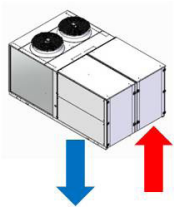
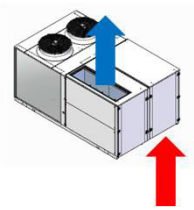


FA. Fresh air
S. Treated air supply
R. Air return
EX. Air exhaust

1. First filtration stage efficiency (G4 efficiency)
2. Second filtration stage (optional): F7 high efficiency filter, F9 high efficiency filter, electronic (E10 equivalent efficiency)r
3. Heating with water coil or electric heaters (optional)
4. Exchanger for air handling
5. Hot gas post-heating (optional)
6. Supply fan section
7. Source side exchanger
8. Electrical panel
9. External fan section
10. Exhaust fan section

Supply and return configurations

FUNCTIONALITIES	CBFFA configuration		
	M0	**M3**	**M5**
	Standard unit	Option	Option
Air supply			

FUNCTIONALITIES	CCFFA configuration		
	M0 - R0	**M3 - R0**	**M5 - R0**
	Standard unit	Option	Option
			
Air supply and return	**M0 - R3**	**M3 - R3**	**M5-R3**
	Option	Option	Option
			

Filter nomenclature in accordance with EN ISO 16890

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

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

Standard unit technical specifications

Compressor
Hermetic Scroll compressor with orbiting spiral, equipped with motor protective device for overtemperatures, overcurrents and excessive temperatures of the supply gas. It is mounted on rubber antivibration mounts and comes with a full oil charge.
An oil heater, which starts automatically, keeps 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 (size 20.4 - 24.4), Digital Scroll and on/off Scroll (size 16.2 - 26.2). They are capacity step controlled.

Structure
The support base is assembled with a painted galvanized steel frame. The internal structure is made of zinc - magnesium bent galvanized steel. The Zn-Mg alloy improves the characteristics in terms of corrosion resistance thanks to the galvanic protection typical of the Zinc-Magnesium combination.

Panelling
Sandwich panels in the air treatment section with dual walls in steel sheet metal with polyurethane insulation (40 kg/m3), thickness of outer sheet metal 6/10 mm galvanized and painted using polyester powders colour RAL 9001, polyurethane thickness 30mm with thermal conductivity coefficient 0.022W/mK, thickness of internal sheet metal 5/10 mm hot galvanized. The panel is also provided with a PVC profile for thermal insulation and a EPDM rubber gasket that ensures the hermetic seal.
All panelling can easily be removed to allow complete accessibility to internal components.

Internal exchanger
Direct expansion finned exchanger, made from copper pipes in staggered rows and mechanically expanded to the fin collars. The fins are made from aluminium with a corrugated surface and adequately distanced to ensure the maximum heat exchange efficiency.

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

Fan
Internal section
Plug fans without scroll with reverse blades driven by electronically-controlled “brushless” dc motors with direct coupling. No transmission sizing is needed.
External section
Helical fans with 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. Located inside an aerodinamically shaped nozzles to increase efficiency and minimise noise levels; fitted with safety grills.

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

Filtration
Outdoor air inlet side
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 located inside the unit and is easily accessible thanks to a hinged panel.
The capacity section includes:
- main door lock isolator switch;
- compressor circuit breaker;
- compressor power supply remote control switch;
- fan motor thermal protections of internal and external section;
- circuit breaker to protect auxiliary circuit..

The microprocessor control section includes:
- compressor overload protection and timer;
- potential-free contacts for remote ON-OFF, cumulative alarm, fire alarm inlet, fan status, compressor status, summer/winter mode, settable input;
- remote control with user interface;
- intuitive graphical interface retro lighted;
- switch on and off daily and weekly programmer and set point;
- unit On/Off and overload reset;
- manual changing of the operating mode (hot or cold);
- display of operating status;
- display of alarms and failure code;
- management of the operating parameters.

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

Version with extraction and exhaust (only CCFFA configuration)
Standard unit specifications like standard version, and then:
- exhaust fan.

Plug fans without scroll with reverse blades driven by electronically-controlled “brushless” DC motors with direct coupling.
No drive sizing is required.
Fans have a regulation control of the air flow rate at.constant value.
Thermodynaic recovery on the exhaust air.

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%)
- F9 - High efficiency F9 air filter (ISO 16890 ePM1 80%)
- FIFD - Electronic filters with iFD technology (ISO 16890 ePM1 90%)
- PSAF - Differential pressure switch for dirty air filters
- PCOSME - Constant airflow in supply and exhaust (available only with version: CCFFA)
- MHP - High and low pressure gauges
- CTERM - Remote keypad for indoor temperature and humidity control
- CPHG - Hot gas re-heating coil
- EH - Electric heaters
- CHW2 - 2-rows hot water coil
- 3WVM - Modulating 2-way valve
- 2WVM - Modulating 3-way valve
- GC - Condensig gas heating module with modulating control
- HSE - Immersed electrodes steam humidifier
- LTEMP1 - Application for low outdoor temperature
- PCM0 - Sandwich panels of the handling zone M10 fire reaction class
- CMSC9 - Serial communication module for Modbus supervisor
- CMSC10 - Serial communication module for LonWorks spervisor
- CMSC11 - Serial communication module for BACnet-IP supervior
- IOTI - IoT industrial module for cloud based interoperability & services
- PM - Phase monitor
- PFCC - Power factor correction capacitors (cosfi > 0.95)
- PGFC - Finned coil protection grilles
- PGCCH - Anti-hail protection grilles
- 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

- RCX - Roof curb
- AMRX - Rubber antivibration mounts
- AMRMX - Rubber antivibration mounts for unit and gas module
- PTAAX - Remote ambient air temperature sensor
- PTUAX - Remote ambient air temperature and humidity probe

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

Test

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

Unit configuration

CSRN-XHE2 FFA	20.4	CCFFA	M0	R0	CHW2	PCOSM	CREFO
		(1)	(2)	(3)	(4)	(5)	(6)

1. Configuration
CBFFA - For fresh air supply only configuration
CCFFA - For fresh air supply with extraction and exhaust configuration

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

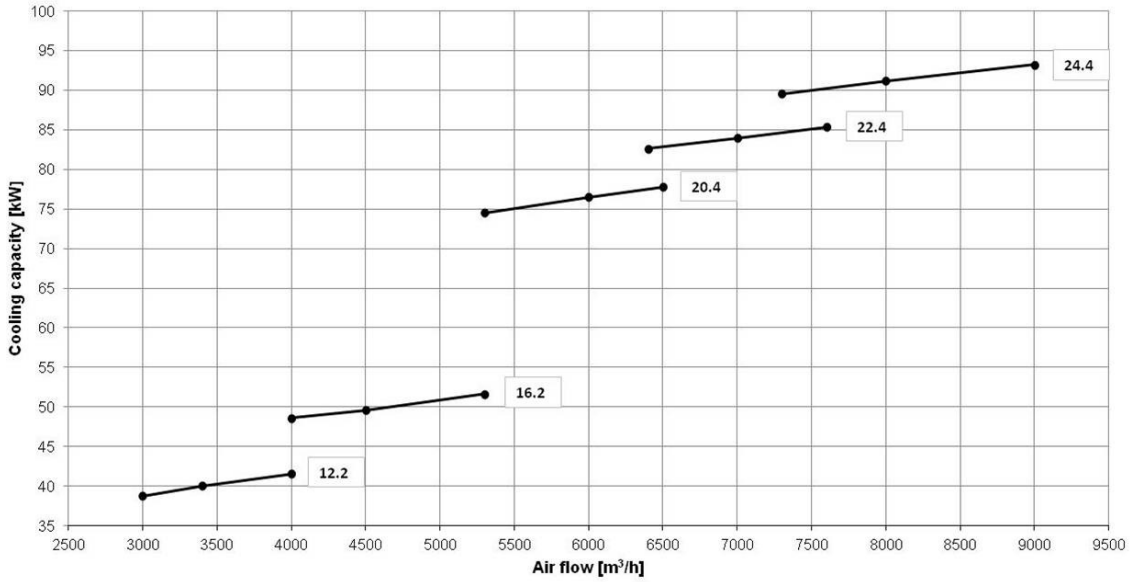
3. Air return
R0 - Horizontal air return (only CCFFA configuration)
R3 - Downward air return (only CCFFA configuration)

4. Auxiliary heating
- not required (Standard)
EH - Electric heaters
CHW2 - 2 rows hot water coil
GC - Gas heating module

5. Airflow
PCOSM - Constant supply airflow (Standard)
PCOSME- Constant airflow in supply and exhaust (only configuration CCFFA)

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

How choosing the unit
The selection of the most appropriate size for an installation can be performed starting from the supply airflow value, established this value it is possible to choose among different available thermo-refrigerant treatments.
It is well-known that buildings built with modern technologies, that improve efficiency, have different needs than the previous buildings. In this case, the designer has to design systems with different potentialities.



Configuration: fresh air supply only (CBFFA)

SIZE			16.2	20.4	22.4	24.4
COOLING						
Cooling capacity	1	kW	49.5	76.1	83.4	90.4
Sensible capacity	1	kW	27.8	38.3	43.3	48.0
Compressor power input	1	kW	12.9	20.0	21.7	23.3
EER	1	-	3.84	3.81	3.84	3.88
HEATING						
Heating capacity	2	kW	50.0	73.2	81.4	89.5
Compressor power input	2	kW	11.9	17.2	18.2	20.7
COP	2		4.20	4.26	4.47	4.32
COMPRESSOR						
Type of compressors	3		Scroll	Scroll	Scroll	Scroll
No. of compressors		Nr	2	4	4	4
Std Capacity control steps		Nr	3	4	4	4
Refrigerant Charge(C1)	4	kg	10,5	8	8	13
Refrigerante Charge (C2)	4	kg	12,5	8,5	14	13
Refrigeration circuits		Nr	2	2	2	2
AIR HANDLING SECTION FANS (SUPPLY)						
Type of supply fan	5		RAD	RAD	RAD	RAD
Number of supply fans		Nr	1	1	1	1
Fan diameter		mm	400	560	560	560
Type of motor	6		EC	EC	EC	EC
Supply airflow		m^3/h	4500	6000	7000	8000
Supply airflow		l/s	1250	1667	1944	2222
Installed unit power		kW	1.3	2.9	2.9	2.9
Max. static pressure supply fan	7	Pa	470	775	730	650
HIGH STATIC PRESSURE AIR HANDLING SECTION FANS (OPTIONAL)						
Type of supply fan	5		RAD	RAD	RAD	RAD
Number of supply fans		Nr	1	1	1	1
Fan diameter		mm	500	500	500	500
Type of motor	8		EC	EC	EC	EC
Supply airflow		l/s	1250	1667	1944	2222
Supply airflow		m^3/h	4500	6000	7000	8000
Installed unit power		kW	2,6	5,5	5,5	5,5
Max. static pressure supply fan		Pa	810	1260	1260	1260
FANS (EXHAUST) (ONLY WITH CCFFA CONFIGURATION)						
Type of exhaust fan	5,8		RAD	RAD	RAD	RAD
Number of exhaust fans	8	Nr	1	1	1	1
Fan diameter	8	mm	400	500	500	500
Type of motor	6		EC	EC	EC	EC
Exhaust airflow	9	m^3/h	4500	6000	7000	8000
Installed unit power	8	kW	1.3	2.6	2.6	2.6
Max. exhaust static pressure	8	Pa	400	670	560	430

1. Fresh air temperature: 35°C D.B./ 24°C W.B. EER referred only to compressors
2. Fresh air temperature: 7°C D.B./ 6°C W.B. COP referred only to compressors
3. SCROLL = Scroll compressor
4. Indicative values for standard units with possible variation +/- 10%. The actual data are shown on the unit's serial label
5. RAD = Radial fan
6. EC = Electronic switching motor
7. Available nett pressure to overcome the supply
8. CCFFA - Configuration for fresh air supply with extraction and exhaust
9. Range of variability of the exhaust air flow (only for CCFFA configuration)

General technical data

EXTERNAL SECTION FANS						
Type of fans	10		AX	AX	AX	AX
Number of fans		Nr	2	2	2	2
Fan diameter		mm	630	800	800	800
Type of motor	11		AC	AC	AC	AC
Standard airflow		m^3/h	25000	42000	42000	42000
Installed unit power		kW	1.05	1.5	1.5	1.5
CONNECTIONS						
Condensate drain		mm	20	20	20	20
POWER SUPPLY						
Standard power supply		V	400/3~/50	400/3~/50	400/3~/50	400/3~/50

10. AX = Axial fan
11. AC = Alternate Current

Sound levels

SIZE	Sound power level (dB) Octave band (Hz)								Sound pressure level	Sound Power Level
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
16.2	76	79	78	80	80	78	75	79	66	85
20.4	92	82	80	81	79	77	74	75	67	84
22.4	92	83	81	82	80	78	75	73	68	85
24.4	92	84	82	84	82	79	76	76	69	87

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

Electrical data

Configuration: fresh air supply only (CBFFA)

SIZE			16.2	20.4	22.4	24.4
F.L.A. - FULL LOAD CURRENT AT MAX ADMISSIBLE CONDITIONS						
F.L.A. - Compressor 1		A	13,6	10,1	10,1	14,3
F.L.A. - Compressor 2		A	17,5	14,3	14,3	14,3
F.L.A. - Compressor 3		A	-	10,1	14,3	14,3
F.L.A. - Compressor 4		A	-	14,3	14,3	14,3
F.L.A. - External Fan unit		A	2,5	3,9	3,9	3,9
F.L.A. - Supply Fan unit		A	2,1	4,4	4,4	4,4
F.L.A. - Total	1	A	38,6	61,5	65,7	69,9
L.R.A. STARTING CURRENT						
L.R.A. - Compressor 1		A	101	64	64	101
L.R.A. - Compressor 2		A	111	101	101	101
L.R.A. - Compressor 3		A	-	64	101	101
L.R.A. - Compressor 4		A	-	101	101	101
F.L.I. - FULL LOAD POWER INPUT AT MAX ADMISSIBLE CONDITIONS						
F.L.I. - Compressor 1		kW	8,3	6,1	6,1	8,3
F.L.I. - Compressor 2		kW	10,2	8,3	8,3	8,3
F.L.I. - Compressor 3		kW	-	6,1	8,3	8,3
F.L.I. - Compressor 4		kW	-	8,3	8,3	8,3
F.L.I. - External Fan unit		kW	1,3	1,9	1,9	1,9
F.L.I. - Supply Fan unit		kW	1,3	2,9	2,9	2,9
F.L.I. - Total	2	kW	22,6	35,8	38	40,1
M.I.C. MAXIMUM INRUSH CURRENT						
M.I.C. - Value		A	129,7	148,2	152,4	156,6

Voltage unbalance between phases: max 2 % Power supply: 400/3~/50 Hz.
Voltage variation: max +/- 10%
Values not including accessories

1. Value including all the unit standard components. 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. Value including all the unit standard components. 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)

General technical data

Configuration: fresh air supply with extraction and exhaust (CCFFA)

SIZE			16.2	20.4	22.4	24.4
F.L.A. - FULL LOAD CURRENT AT MAX ADMISSIBLE CONDITIONS						
F.L.A. - Compressor 1		A	13,6	10,1	10,1	14,3
F.L.A. - Compressor 2		A	17,5	14,3	14,3	14,3
F.L.A. - Compressor 3		A	-	10,1	14,3	14,3
F.L.A. - Compressor 4		A	-	14,3	14,3	14,3
F.L.A. - External Fan unit		A	2,5	3,9	3,9	3,9
F.L.A. - Supply Fan unit		A	2,1	4,4	4,4	4,4
F.L.A. - Exhaust Fan unit		A	2,1	4	4	4
F.L.A. - Total	1	A	40,7	65,4	69,6	73,8
L.R.A. STARTING CURRENT						
L.R.A. - Compressor 1		A	101	64	64	101
L.R.A. - Compressor 2		A	111	101	101	101
L.R.A. - Compressor 3		A	-	64	101	101
L.R.A. - Compressor 4		A	-	101	101	101
F.L.I. - FULL LOAD POWER INPUT AT MAX ADMISSIBLE CONDITIONS						
F.L.I. - Compressor 1		kW	8,3	6,1	6,1	8,3
F.L.I. - Compressor 2		kW	10,2	8,3	8,3	8,3
F.L.I. - Compressor 3		kW	-	6,1	8,3	8,3
F.L.I. - Compressor 4		kW	-	8,3	8,3	8,3
F.L.I. - External Fan unit		kW	1,3	1,9	1,9	1,9
F.L.I. - Supply Fan unit		kW	1,3	2,9	2,9	2,9
F.L.I. - Return Fan unit		kW	1,3	2,6	2,6	2,6
F.L.I. - Total	2	kW	23,9	38,4	40,6	42,7
M.I.C. MAXIMUM INRUSH CURRENT						
M.I.C. - Value		A	131,8	152,2	156,4	160,6

Voltage unbalance between phases: max 2 % Power supply: 400/3~/50 Hz.
Voltage variation: max +/- 10%
Values not including accessories

1. Value including all the unit standard components. 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. Value including all the unit standard components. To obtain the value of F.L.I. including accessories, add to the total F.L.I. value that of any accessories (see electrical data of accessories).

Electrical input of optional components

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

SIZE			16.2	20.4	22.4	24.4
F.L.A. FULL LOAD CURRENT						
F.L.A. EH12 - 9 kW electric heaters		A	13,0	-	-	-
F.L.A. EH15 - 13.5 kW electric heaters		A	19,5	-	-	-
F.L.A. EH17 - 18 kW electric heaters		A	-	26,0	26,0	26,0
F.L.A. EH26 - 27 kW electric heaters		A	-	39,0	39,0	39,0
F.L.A. HSE5 - Immersed electrodes steam humidifier of 5kg/h		A	5,4	-	-	-
F.L.A. HSE8 - Immersed electrodes steam humidifier of 8 kg/h		A	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
F.L.A. LTEMP1 - Configuration for low external temperature		A	1,0	1,0	1,0	1,0
F.L.A. VENH - High static pressure fans		A	1,9	4,0	4,0	4,0
F.L.I. POWER CONSUMPTION:						
F.L.I. EH12 - 9 kW electric heaters		kW	9,0	-	-	-
F.L.I. EH15 - 13.5 kW electric heaters		kW	13,5	-	-	-
F.L.I. EH17 - 18 kW electric heaters		kW	-	18,0	18,0	18,0
F.L.I. EH26 - 27 kW electric heaters		kW	-	27,0	27,0	27,0
F.L.I. HSE5 - Immersed electrodes steam humidifier of 5 kg/h		kW	3,8	-	-	-
F.L.I. HSE8 - Immersed electrodes steam humidifier of 8 kg/h		kW	6,0	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
F.L.I. LTEMP1 - Configuration for low external temperature		kW	0,3	0,3	0,3	0,3
F.L.I. VENH - High static pressure fans		kW	1,3	2,6	2,6	2,6

The Demand Limit function, present in the Rooftop Clivet units, is not available for the CLIVETPACK^2 FFA unit series. In particular conditions, the full fresh air proper operating may indeed require the access to all the available resources.

Pressure drops of optional components

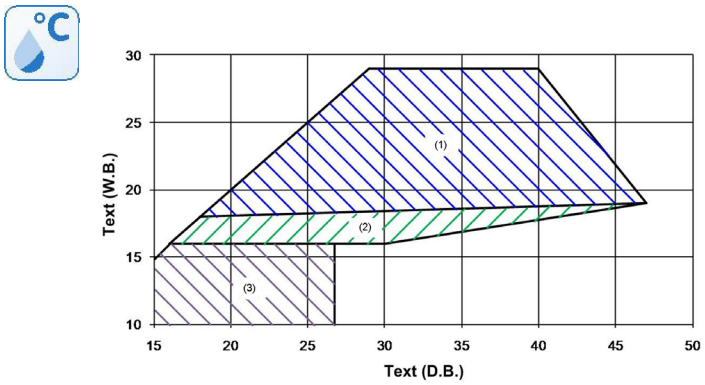
The value of static pressure available on the supply and return duct is obtained by subtracting from the available net maximum pressure (see general table of technical data) the pressure drops of any accessories.

SIZE			16.2	20.4	22.4	24.4
CHW2 - 2 rows hot water coil		Pa	23	17	21	25
CPHG - Hot gas re-heating coil		Pa	14	11	12	14
GC - Gas heating module		Pa	70	54	67	80
F7 - F7 high efficiency air filter (ISO 16890 ePM1 55%)	1	Pa	145	120	128	138
F9 - F9 high efficiency air filter (ISO 16890 ePM1 80%)	1	Pa	185	160	168	178
FIFD - Electronic filters with iFD technology (ISO 16890 ePM1 90%)	1	Pa	45	8	20	32

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 indicative and take into consideration:
- general and non specific sizes
- standard airflow
- operation at full load
- unit correctly installed and serviced

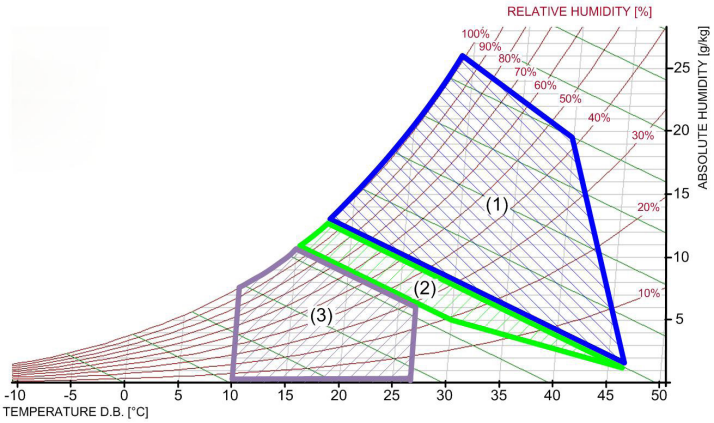
Text (D.B.) = Ambient air temperqature / handling coil inlet
dry bulb measured temperature
(D.B.=DRY BULB)

Text (W.B.) = Ambien air temperature / handling coil inlet
WARNING! WET BULB TEMPERATURE
(W.B. = WET BULB)

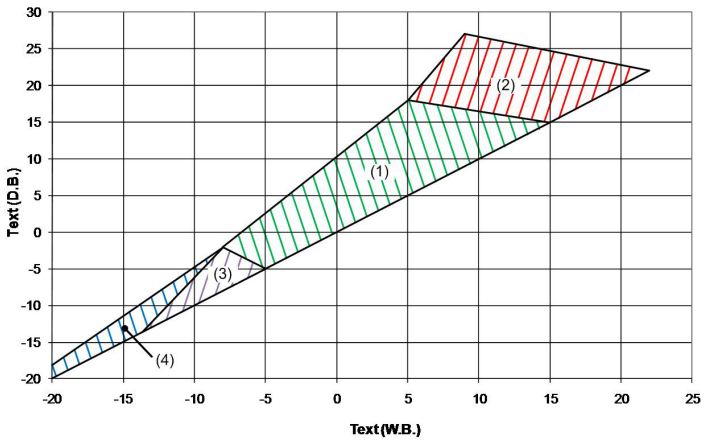
1. Operation range at full load
2. Operating field at partial load (one active compressor for each refrigerant circuit)
3. FREE-COOLING range operating

WET BULB TEMPERATURE - EXAMPLE

28°C W.B. { 40°C D.B. / 41%R.H. | 35°C D.B. / 59%R.H. | 30°C D.B. / 86%R.H.



Operating range (Heating)

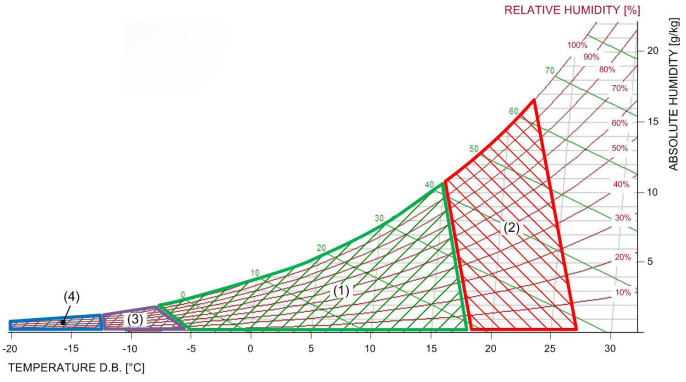


The limits are indicative and take into consideration:
- general and non specific sizes
- standard airflow
- operation at full load
- unit correctly installed and serviced

Text (D.B.) = Ambient air temperqature / handling coil inlet
dry bulb measured temperature
(D.B.=DRY BULB)

TEXT (W.B.) = Fresh air temperature/inlet of treatment coil
WARNING! WET BULB TEMPERATURE
(W.B. = WET BULB)

1. Operation range at full load
2. Operating field at partial load (one active compressor for each refrigerant circuit)
3. Operating field of the unit with external low temperature equipment and pre-heating resistances or hot water coil options.
4. Operating field of the unit with external low temperature equipment and hot water coil or gas heating module options



Option compatibility

RIF.	DESCRIPTION	CBFFA	CCFFA
	VERSIONS		
RE1	Active Energy recovery of expelled air	-	√
	CONFIGURATIONS		
CREFO	Device for fan consumption reduction of the external section, on/off type	√	√
CREFB	Device for fan consumption reduction of the external section, ECOBREEZE type	O	O
CHW2	Two-rows hot water coil	O	O
GC	Condensing gas heating module with modulating control	O	O
PCM0	Sandwich panels of the handling zone in M0 fire reaction class	O	O
AMRX	Rubber antivibration mounts	◊	◊
AMRMX	Rubber antivibration mounts for unit and gas module	◊	◊
PGFC	Finned coil protection grill	O	O
PGCCH	Anti-hail protection grilles	O	O
	REFRIGERATION CIRCUIT		
EVE	Electronic expansion valve	√	√
LTEMP1	Application for low outdoor temperature	O	O
MHP	High and low pressure gauges	O	O
CPHG	Hot gas re-heating coil	O	O
	AERAULIC CIRCUIT		
M0	Horizontal air supply	√	√
M3	Downward air supply	O	O
M5	Upflow air supply	O	O
RO	Horizontal air return	-	√
R3	Downward air return	-	O
DAOP	Overpressure damper on the fresh air	√	√
VENH	High static pressure fans	O	O
PCOSM	Constant supply airflow	√	√
PCOSME	Constant airflow in supply and exhaust (available only with version: CCFFA)	-	O
HSE	Immersed electrodes steam humidifier	O	O
FPG4	Pleated air filter class G4 (ISO 16890 Coarse 60%)	√	√
F7	High efficiency F7 air filter (ISO 16890 ePM1 55%)	O	O
F9	High efficiency F9 air filter (ISO 16890 ePM1 80%)	O	O
FIFD	Electronic filters with iFD technology (ISO 16890 ePM1 90%)	O	O
PSAF	Clogged filter differential pressure switch air side	O	O
	HYDRAULIC CIRCUIT		
2WVM	Modulating 2-way valve	O	O
3WVM	Modulating 3-way valve	O	O
	CIRCUITO ELETTRICO		
THTUNE	Wall mounted electronic room control	√	√
CTERM	Remote keypad for indoor temperature and humidity control	O	O
EH	Electric heaters.	O	O
CMSC9	Serial communication module to Modbus supervisor	O	O
CMSC10	Serial communication module to LonWorks supervisor	O	O
CMSC11	Serial communication module for BACnet-IP supervisor	O	O
IOTI	IoT industrial module for cloud based interoperability & services	O	O
SFSTC	Progressive compressor start-up Soft starter	O	O
PTAAX	Remote ambient air temperature sensor	◊	◊
PTUAX	Remote ambient air temperature and humidity probe	◊	◊
PM	Phase monitor	O	O
PFCC	Power factor correction capacitors (cosfi > 0.95)	O	O
	VARIOUS		
RCX	Roof curb	◊	◊
PTCO	Set up for shipping via container	O	O

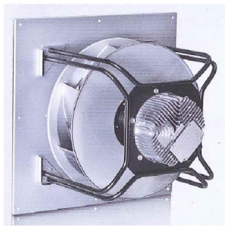
√ Standard component
O Optional component
◊ Separately supplied accessory (optional)
- Not available

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

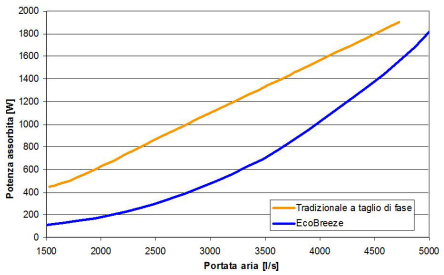
Device for fan consumption reduction of the external section, ECOBREEZE type

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.





EC TECHNOLOGY



⚠ Option not available for sizes 12.2-16.2

PSAF

Clogged filter differential pressure switch air side

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



F7

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

F9

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

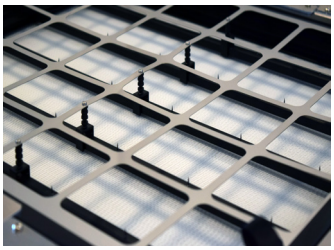


The class F7/F9 are filtering components that are in addition to the standard G4 filters, for more effective filtering. They are widely used in air conditioning systems and industrial applications that require suitable performance concerning fine dusts and particles with dimensions greater than 1 µm. Class F7/F9 filters are made of fibreglass paper, pleated with constant calibrated spacing, mounted on a metallic frame; the ample filtering surface reduces air side pressure drops. Class F7/F9 filters must be replaced after reaching their limits of dirtiness with scheduled periodic maintenance. An optional accessory, dirty filter differential switch, can be fitted to signal when admissible limit of fouling has been reached so as not to excessively reduce the airflow with respect to the nominal value.

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

FIFD

Electronic filters with iFD technology (ISO 16890 ePM1 90%)

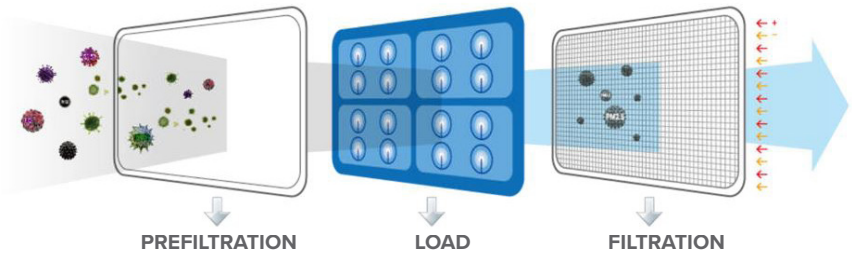


High efficiency filters with active electrostatic system with an intense dielectric field are additional filtration components to standard ISO 16890 Coarse 60% filters (G4). They are effective on a wide range of pollutants, including pollen, dust, microdust and nanodust, toners, moulds, smog, bacteria and viruses with a typical efficiency up to 99.99%.
The air filtration process follows the most advanced air purification technologies and consists of these phases:

- First pre-filtration phase
- Second ionisation phase, in which the particles are charged by passing through a thin perforated metal plate with needle electrodes in the centre of each hole.
- Third absorption phase, in which the charged dust particles are captured by a strong and intense dielectric field formed by a honeycomb tube.

The iFD electronic filters have a very high filtration efficiency with low pressure drops and therefore reduced ventilation consumption compared to traditional filters. The typical air crossing speeds reached in Clivet units ensure filtration efficiencies higher than ISO 16890 ePM1 90% (equivalent to class E10 of absolute filters in accordance with EN 1822).
For this result to be guaranteed and the microbicidal action against bacteria and viruses to be kept steady over time while ensuring minimum load drops, the filters require proper maintenance. This is extremely simple and is done by washing them with a standard kitchen degreaser. This means that the filter cell does not need replacing, just washing.
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. Intervention on the filters during the unit's routine maintenance includes washing the electronic cells on site.
The higher initial cost, compared to a traditional mechanical filter, can be amortised in a short time. Indeed, the lifecycle of the electrostatic filters is the same as that of the unit, whereas mechanical filters need to be replaced preiodically.

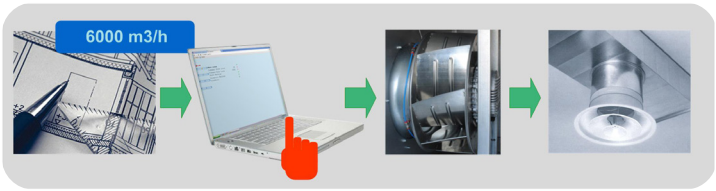
⚠ This option reduces the available static pressure (supply air side).
⚠ iFD electronic filters are not suitable for filtering water vapours even in low concentrations, oily vapours, large quantities of dust, shavings and iron filing dust, residues in general and gases.
⚠ All the following substances must be absolutely avoided with electronic filters: metallic material dust, even if very fine; fumes produced by the combustion of organic and non-organic materials; flour dust; dust and vapours from potentially explosive atmospheres.



PCOSM
PCOSME

Constant supply airflow (Standard)
Constant airflow in supply and exhaust (available only with version: CCFFA)

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.

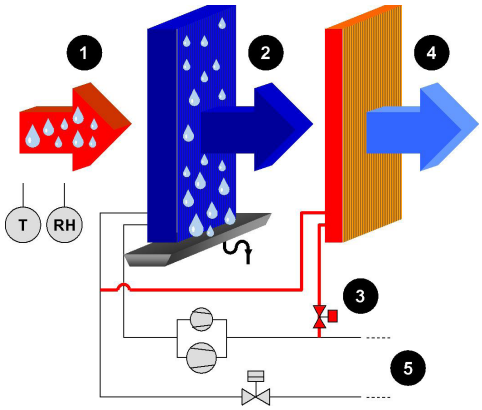


CPHG

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 treatment 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 working based on the humidity set-point established by the user. With respect to traditional devices, such as electrical heating 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 power is increased, resulting in greater efficiency (EER). The ambient humidity control is performed by the ambient sensor equipped with an integrated humidity probe (standard with unit).

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



1. Fresh 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

Performances of hot gas re-heating coil

SIZE				OUTDOOR AIR TEMPERATURE [°C]														
				25	27	30	32	35	25	27	30	32	35	25	27	30	32	35
	Qo (m³/h)			4000					4500					5300				
	Qo (l/s)			1111					1250					1472				
16.2	Tin (°C)	10	kWt	9,3	10,1	11,1	12,2	13,3	10,0	10,8	11,9	13,1	14,2	11,0	11,9	13,1	14,4	15,7
			Tout	16,7	17,3	18,0	18,8	19,6	16,4	16,9	17,6	18,4	19,1	16,0	16,5	17,1	17,8	18,5
		12	kWt	8,7	9,4	10,4	11,5	12,6	9,3	10,0	11,2	12,3	13,5	10,2	11,1	12,3	13,6	14,9
			Tout	18,3	18,8	19,5	20,3	21,1	18,0	18,5	19,2	19,9	20,7	17,6	18,1	18,7	19,5	20,2
		14	kWt	8,0	8,7	9,7	10,8	11,8	8,6	9,3	10,4	11,6	12,7	9,4	10,3	11,5	12,7	14,0
			Tout	19,8	20,4	21,1	21,9	22,6	19,6	20,0	20,8	21,5	22,3	19,2	19,7	20,3	21,0	21,7
		16	kWt	7,3	8,0	9,0	10,1	11,1	7,8	8,6	9,7	10,8	12,0	8,6	9,4	10,7	11,9	13,2
			Tout	21,4	21,9	22,6	23,4	24,2	21,1	21,6	22,3	23,1	23,9	20,8	21,2	21,9	22,6	23,3
		18	kWt	6,6	7,3	8,3	9,4	10,5	7,1	7,8	8,9	10,1	11,2	7,8	8,6	9,9	11,1	12,4
			Tout	22,9	23,4	24,2	25,0	25,8	22,7	23,1	23,9	24,7	25,4	22,4	22,8	23,5	24,2	24,9
		20	kWt	6,0	6,6	7,6	8,7	9,8	6,4	7,1	8,2	9,3	10,5	7,0	7,8	9,0	10,3	11,6
			Tout	24,5	24,9	25,7	26,5	27,3	24,2	24,7	25,4	26,2	27,0	23,9	24,4	25,1	25,8	26,5

Qo = Airflow rate
Tin = Leaving temperature from the handling coil and entering the post-heating coil (°C)
kWt = Provided heating capacity (kW)
Tout = Leaving temperature from the post-heating coil (°C)

The reheating coil is powered by the cold gas bled from the condensing coil.
As the condensation hot gas temperature is linked to the fresh air temperature, the indicative potentials of the post-heating coil are expressed according to the fresh air temperature.

SIZE				OUTDOOR AIR TEMPERATURE [°C]														
				25	27	30	32	35	25	27	30	32	35	25	27	30	32	35
20.4	Qo (m³/h)			5300					6000					6500				
	Qo (l/s)			1472					1667					1806				
	Tin (°C)	10	kWt	14,1	15,2	16,7	18,4	20,0	15,3	16,4	18,1	19,9	21,6	16,0	17,2	19,0	20,9	22,8
			Tout	17,7	18,3	19,1	20,0	20,9	17,4	17,9	18,7	19,6	20,4	17,1	17,6	18,4	19,3	20,1
		12	kWt	13,1	14,1	15,7	17,3	18,9	14,1	15,3	17,0	18,7	20,5	14,8	16,0	17,8	19,7	21,5
			Tout	19,2	19,7	20,6	21,5	22,4	18,8	19,4	20,2	21,0	21,9	18,6	19,1	20,0	20,8	21,6
		14	kWt	12,0	13,1	14,6	16,2	17,8	13,0	14,1	15,8	17,6	19,3	13,7	14,9	16,6	18,5	20,3
			Tout	20,6	21,2	22,1	22,9	23,8	20,3	20,9	21,7	22,6	23,4	20,2	20,7	21,5	22,3	23,1
		16	kWt	11,0	12,0	13,6	15,2	16,8	11,9	13,0	14,7	16,4	18,2	12,5	13,7	15,4	17,3	19,1
			Tout	22,1	22,7	23,6	24,4	25,3	21,8	22,4	23,2	24,0	24,9	21,7	22,2	23,0	23,8	24,7
		18	kWt	10,0	11,0	12,5	14,1	15,7	10,8	11,9	13,6	15,3	17,0	11,3	12,5	14,3	16,1	17,9
			Tout	23,6	24,2	25,0	25,9	26,8	23,3	23,9	24,7	25,6	26,4	23,2	23,7	24,5	25,3	26,2
		20	kWt	8,9	10,0	11,5	13,1	14,7	9,7	10,8	12,4	14,1	15,9	10,2	11,3	13,1	14,9	16,7
			Tout	25,0	25,6	26,5	27,4	28,3	24,8	25,4	26,2	27,0	27,9	24,7	25,2	26,0	26,8	27,7
22.4	Qo (m³/h)			6400					7000					7600				
	Qo (l/s)			1778					1944					2111				
	Tin (°C)	10	kWt	15,9	17,1	18,9	20,7	22,5	16,8	18,1	19,9	21,9	23,8	17,7	19,0	21,0	23,0	25,1
			Tout	17,2	17,7	18,5	19,3	20,1	16,9	17,5	18,2	19,0	19,8	16,7	17,2	18,0	18,7	19,5
		12	kWt	14,7	15,9	17,7	19,5	21,3	15,5	16,8	18,7	20,6	22,6	16,3	17,7	19,6	21,7	23,7
			Tout	18,7	19,2	20,0	20,8	21,7	18,4	19,0	19,8	20,5	21,4	18,2	18,8	19,5	20,3	21,1
		14	kWt	13,5	14,7	16,5	18,3	20,1	14,3	15,6	17,4	19,3	21,3	15,0	16,4	18,3	20,3	22,4
			Tout	20,2	20,7	21,5	22,4	23,2	20,0	20,5	21,3	22,1	22,9	19,8	20,3	21,0	21,8	22,6
		16	kWt	12,4	13,5	15,3	17,1	18,9	13,1	14,3	16,2	18,1	20,0	13,7	15,1	17,0	19,0	21,0
			Tout	21,7	22,2	23,0	23,9	24,7	21,5	22,0	22,8	23,6	24,4	21,3	21,9	22,6	23,4	24,1
		18	kWt	11,2	12,4	14,1	15,9	17,7	11,9	13,1	14,9	16,8	18,7	12,5	13,8	15,7	17,7	19,7
			Tout	23,2	23,7	24,5	25,4	26,2	23,0	23,5	24,3	25,1	25,9	22,9	23,4	24,1	24,9	25,7
		20	kWt	10,1	11,2	13,0	14,7	16,5	10,6	11,9	13,7	15,6	17,5	11,2	12,5	14,4	16,4	18,4
			Tout	24,7	25,2	26,1	26,9	27,7	24,5	25,1	25,8	26,7	27,5	24,4	24,9	25,7	26,4	27,2
24.4	Qo (m³/h)			7300					8000					9000				
	Qo (l/s)			2028					2222					2500				
	Tin (°C)	10	kWt	17,2	18,5	20,5	22,4	24,5	18,2	19,6	21,6	23,7	25,9	19,5	21,0	23,2	25,5	27,8
			Tout	16,8	17,3	18,1	18,8	19,7	16,6	17,1	17,8	18,5	19,3	16,2	16,7	17,4	18,2	18,9
		12	kWt	15,9	17,2	19,2	21,1	23,1	16,9	18,2	20,3	22,4	24,5	18,1	19,6	21,7	24,0	26,3
			Tout	18,3	18,8	19,6	20,4	21,2	18,1	18,6	19,4	20,1	20,9	17,8	18,3	19,0	19,7	20,5
		14	kWt	14,7	16,0	17,9	19,8	21,8	15,5	16,9	18,9	21,0	23,1	16,6	18,1	20,3	22,5	24,8
			Tout	19,9	20,4	21,2	21,9	22,7	19,7	20,2	20,9	21,7	22,4	19,4	19,9	20,6	21,3	22,1
		16	kWt	13,4	14,7	16,6	18,5	20,5	14,2	15,5	17,5	19,6	21,7	15,2	16,7	18,8	21,1	23,3
			Tout	21,4	21,9	22,7	23,5	24,3	21,2	21,7	22,4	23,2	24,0	21,0	21,5	22,2	22,9	23,6
		18	kWt	12,2	13,4	15,3	17,3	19,2	12,9	14,2	16,2	18,3	20,3	13,8	15,2	17,4	19,6	21,8
			Tout	23,0	23,4	24,2	25,0	25,8	22,8	23,3	24,0	24,8	25,5	22,5	23,0	23,7	24,5	25,2
		20	kWt	10,9	12,2	14,1	16,0	17,9	11,5	12,9	14,9	16,9	19,0	12,4	13,8	15,9	18,1	20,4
			Tout	24,5	25,0	25,8	26,5	27,3	24,3	24,8	25,6	26,3	27,1	24,1	24,6	25,3	26,0	26,8

Qo = Airflow rate
Tin = Leaving temperature fro the handling coil and entering the post-heating coil (°C)
kWt = Provided heating capac y (kW)
Tout = Leaving temperature fr n the post-heating coil (°C)

The reheating coil is powered y the cold gas bled from the condensing coil.
As the condensation hot gas t mperature is linked to the fresh air temperature, the indicative potentials of the post-heating coil are expressed according to the fresh air temperature.

MHP

High and low pressure gauges

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



CTERM

Remote keypad for indoor temperature and humidity control

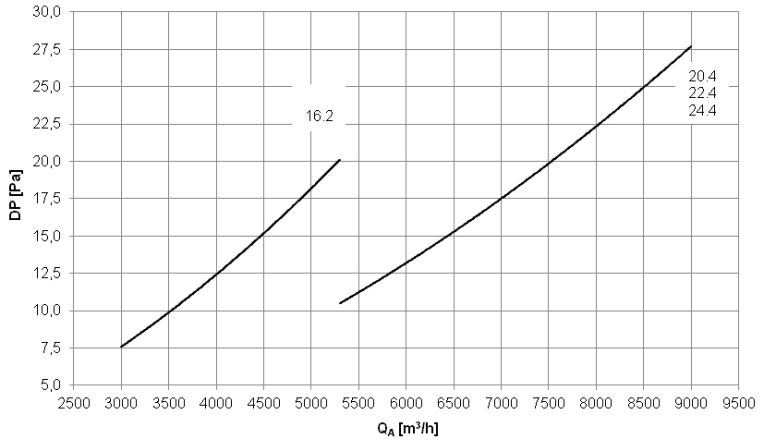
This option makes it possible to directly measure the temperature and humidity of the ambient. The automatic thermal regulation is done on the humidity and temperature probes in the thermostat installed in ambient.

CHW2

Two-rows hot water coil

Option recommended for very cold climates since it allows heating of the served room. The battery is equipped with a thermostat for the anti-freeze function. The anti-freeze function is always active, even when the unit is in standby.
If necessary, it forces opening of the valve to the maximum allowable value for allow passage of water in the coil and to prevent the formation of ice. In heat pump mode, the hot water coil may allow both pre-heating of the entering main coil air temperature, as well as integration of the capacity provided by the heat pump.
As an alternative, it may intervene in complete substitution of the heating capacity provided by the compressors.
This is possible by setting a turning point, i.e. a temperature limit of the fresh air below which use of the compressors is blocked, and the water coil is used as the sole resource. If the water coil provides pre-heating of the air, the control logic reduces its power to a preset value, which keeps the compressors from operating with condensation temperatures that are too high.
If instead the water coil is used as the main resource (e.g. because the compressors are not available), the maximum power will be provided.

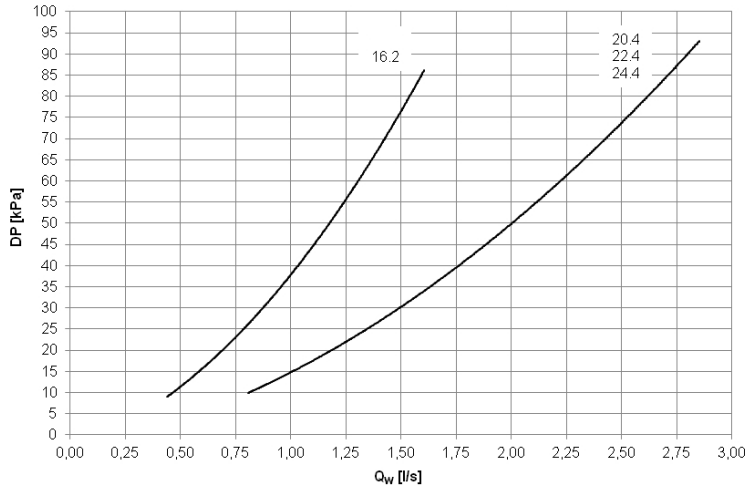
Hot water coil pressure drops: AIR side



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 [kPa] = pressure drops

CHW2 Hot water coil pressure drops: WATER side



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 rows hot water coil' , 'Electric elements' and gas module cannot be assembled simultaneously.

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

The water flow rate must be calculated with the following formula

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

P = Heating capacity in kW
DT = Temperature difference between entering / leaving water

Performances of hot water coil (2 rows)

SIZE				Ti/To (°C)														
				80/70	80/65	70/55	70/60	60/40	80/70	80/65	70/55	70/60	60/40	80/70	80/65	70/55	70/60	60/40
	Qo (m³/h)			4000					4500					5300				
	Qo (l/s)			1111					1250					1472				
16.2	Tin (°C)	-10	kWt	68,6	66,0	57,6	60,1	46,4	74,3	71,5	62,4	65,2	50,2	83,0	79,8	69,5	72,7	55,9
			Tout	36,0	34,2	28,6	30,3	21,1	34,3	32,6	27,2	28,8	19,9	32,0	30,4	25,2	26,8	18,3
		-5	kWt	63,8	61,4	53,0	55,5	42,0	69,2	66,5	57,4	60,2	45,4	77,3	74,1	64,0	67,2	50,5
			Tout	38,6	36,9	31,2	32,9	23,7	37,0	35,4	29,8	31,5	22,6	34,8	33,2	28,0	29,6	21,0
		0	kWt	59,2	56,8	48,5	51,0	37,6	64,2	61,5	52,5	55,3	40,6	71,7	68,6	58,6	61,7	45,2
			Tout	41,2	39,5	33,7	35,5	26,1	39,7	38,0	32,4	34,2	25,1	37,6	36,0	30,8	32,4	23,7
		5	kWt	54,7	52,3	44,1	46,6	33,3	59,3	56,7	47,8	50,5	36,0	66,2	63,2	53,3	56,4	40,0
			Tout	43,7	42,0	36,2	38,0	28,6	42,3	40,7	35,1	36,8	27,7	40,4	38,8	33,5	35,1	26,4
		10	kWt	50,2	47,9	39,8	42,2	29,0	54,5	51,9	43,1	45,7	31,4	60,9	57,9	48,1	51,1	34,9
			Tout	46,2	44,5	38,7	40,4	30,9	44,9	43,3	37,6	39,3	30,1	43,1	41,5	36,2	37,8	29,0
		15	kWt	45,9	43,5	35,5	37,9	24,8	49,8	47,2	38,5	41,1	26,8	55,6	52,7	42,9	46,0	29,9
			Tout	48,7	46,9	41,0	42,8	33,2	47,5	45,8	40,1	41,8	32,5	45,8	44,2	38,8	40,5	31,6

Ti/To = Water temperature inlet/outlet (°C)
Qo = Airflow rate
Tin = Air inlet temperature of water coil (°C)
kWt = Provided heating capacity (kW)
Tout = Air outlet temperature from water coil (°C)

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.

CHW2 Performances of hot water coil (2 rows)

SIZE				Ti/To (°C)														
				80/70	80/65	70/55	70/60	60/40	80/70	80/65	70/55	70/60	60/40	80/70	80/65	70/55	70/60	60/40
20.4	Qo (m³/h)			5300					6000					6500				
	Qo (l/s)			1472					1667					1806				
	Tin (°C)	-10	kWt	101,6	98,2	85,9	89,4	69,8	111,0	107,1	93,7	97,6	76,0	117,4	113,3	99,0	103,2	80,3
			Tout	41,4	39,7	33,4	35,2	25,3	39,6	37,8	31,9	33,6	24,0	38,4	36,7	30,8	32,6	23,1
		-5	kWt	94,9	91,5	79,3	82,8	63,3	103,7	99,9	86,6	90,4	69,0	109,7	105,6	91,5	95,6	72,8
			Tout	43,9	42,1	35,9	37,7	27,6	42,2	40,5	34,4	36,1	26,4	41,1	39,4	33,4	35,2	25,6
		0	kWt	88,3	85,0	72,9	76,3	56,9	96,5	92,8	79,5	83,3	62,0	102,1	98,1	84,1	88,2	65,5
			Tout	46,3	44,6	38,3	40,0	29,9	44,7	43,0	36,9	38,6	28,7	43,7	42,0	36,0	37,7	28,0
		5	kWt	81,8	78,5	66,5	69,9	50,6	89,4	85,8	72,6	76,4	55,1	94,6	90,7	76,7	80,8	58,2
			Tout	48,7	46,9	40,5	42,4	32,0	47,2	45,5	39,3	41,1	31,0	46,2	44,5	38,4	40,2	30,4
		10	kWt	75,4	72,2	60,2	63,6	44,4	82,5	78,8	65,7	69,5	48,3	87,3	83,4	69,5	73,5	51,0
			Tout	51,0	49,3	42,7	44,6	34,2	49,6	47,9	41,6	43,4	33,2	48,7	47,0	40,8	42,6	32,6
		15	kWt	69,1	65,9	54,0	57,4	38,2	75,6	72,0	58,9	62,7	41,6	80,0	76,1	62,3	66,3	43,9
			Tout	53,3	51,5	44,9	46,8	36,1	52,0	50,2	43,8	45,7	35,3	51,1	49,4	43,1	44,9	34,8
22.4	Qo (m³/h)			6400					7000					7600				
	Qo (l/s)			1778					1944					2111				
	Tin (°C)	-10	kWt	116,1	112,1	98,0	102,1	79,4	101,6	98,2	85,9	89,4	69,8	101,6	98,2	85,9	89,4	69,8
			Tout	38,6	37,0	31,0	32,8	23,3	28,9	27,6	22,9	24,2	16,7	25,8	24,6	20,3	21,5	14,6
		-5	kWt	108,5	104,5	90,5	94,6	72,1	94,9	91,5	79,3	82,8	63,3	94,9	91,5	79,3	82,8	63,3
			Tout	41,3	39,6	33,6	35,4	25,8	32,0	30,7	25,9	27,3	19,7	29,1	27,9	23,5	24,8	17,7
		0	kWt	101,0	97,1	83,2	87,2	64,8	88,3	85,0	72,9	76,3	56,9	88,3	85,0	72,9	76,3	56,9
			Tout	43,9	42,2	36,2	37,9	28,2	35,1	33,8	29,0	30,3	22,6	32,3	31,1	26,7	27,9	20,8
		5	kWt	93,6	89,7	75,9	79,9	57,6	81,8	78,5	66,5	69,9	50,6	81,8	78,5	66,5	69,9	50,6
			Tout	46,4	44,7	38,6	40,4	30,5	38,1	36,8	31,9	33,3	25,5	35,5	34,3	29,8	31,0	23,9
		10	kWt	86,3	82,5	68,7	72,7	50,5	75,4	72,2	60,2	63,6	44,4	75,4	72,2	60,2	63,6	44,4
			Tout	48,9	47,2	40,9	42,8	32,7	41,1	39,7	34,8	36,2	28,3	38,6	37,4	32,8	34,1	26,8
		15	kWt	79,1	75,3	61,6	65,6	43,4	69,1	65,9	54,0	57,4	38,2	69,1	65,9	54,0	57,4	38,2
			Tout	51,3	49,5	43,2	45,1	34,9	44,0	42,6	37,6	39,1	31,0	41,7	40,4	35,8	37,2	29,7
24.4	Qo (m³/h)			7300					8000					9000				
	Qo (l/s)			2028					2222					2500				
	Tin (°C)	-10	kWt	127,2	122,7	107,2	111,8	86,8	101,6	98,2	85,9	89,4	69,8	101,6	98,2	85,9	89,4	69,8
			Tout	36,7	35,1	29,4	31,1	21,9	24,0	22,9	18,8	20,0	13,4	20,3	19,2	15,6	16,6	10,8
		-5	kWt	118,9	114,4	99,1	103,6	78,7	94,9	91,5	79,3	82,8	63,3	94,9	91,5	79,3	82,8	63,3
			Tout	39,5	37,8	32,1	33,8	24,4	27,4	26,2	22,1	23,3	16,6	23,8	22,8	19,1	20,1	14,2
		0	kWt	110,7	106,3	91,0	95,6	70,8	88,3	85,0	72,9	76,3	56,9	88,3	85,0	72,9	76,3	56,9
			Tout	42,2	40,5	34,7	36,4	27,0	30,7	29,6	25,3	26,5	19,8	27,3	26,3	22,5	23,6	17,6
		5	kWt	102,6	98,3	83,1	87,6	62,9	81,8	78,5	66,5	69,9	50,6	81,8	78,5	66,5	69,9	50,6
			Tout	44,8	43,1	37,2	39,0	29,4	34,0	32,8	28,5	29,7	22,9	30,7	29,7	25,9	27,0	20,9
		10	kWt	94,7	90,3	75,2	79,7	55,2	75,4	72,2	60,2	63,6	44,4	75,4	72,2	60,2	63,6	44,4
			Tout	47,4	45,7	39,7	41,5	31,8	37,2	36,0	31,7	32,9	26,0	34,2	33,1	29,3	30,4	24,2
		15	kWt	86,8	82,5	67,5	71,9	47,4	69,1	65,9	54,0	57,4	38,2	69,1	65,9	54,0	57,4	38,2
			Tout	49,9	48,2	42,1	43,9	34,1	40,3	39,2	34,8	36,1	29,0	37,5	36,5	32,6	33,7	27,5

Ti/To = Water temperature inlet/outlet (°C)
Qo = Airflow rate
Tin = Air inlet temperature of water coil (°C)
kWt = Provided heating capacity (kW)
Tout = Air outlet temperature from water coil (°C)

Thermal yields referred to the max. water coil capacity. The thermo regulator coke the 3-way modulating valve limiting the inlet air temperature at desired values.

EH

Electric heaters

The option is indicated for cold climate and provide preheat of entering air to the handling coil and thereby increase unit capacity. Ideal for lower outside temperature applications where it is required to active the heaters only for short duration in the year. In these cases, simplification of the system is more economical than electrical conduction cost. The fins are made of aluminium, with a size suitable to ensure high efficiency and maintain low power density on the surfaces to limit overheating. The low temperature of the heating heaters increases their lifespan and limits the effect of air ionization.
The electrical heating heaters are managed by a thermal control device with two power settings.
The electric heater activation depends on the outside air temperature. This electric heater generate a preliminary treatment of the outside air before entering into the active thermodynamic heat recovery exchanger. In the event that fresh air temperature is lower than the preset control parameter, the unit stops both electric heater and ventilation in order to prevent introduction of too cold air in the served space(s).

Matching of the electric heaters

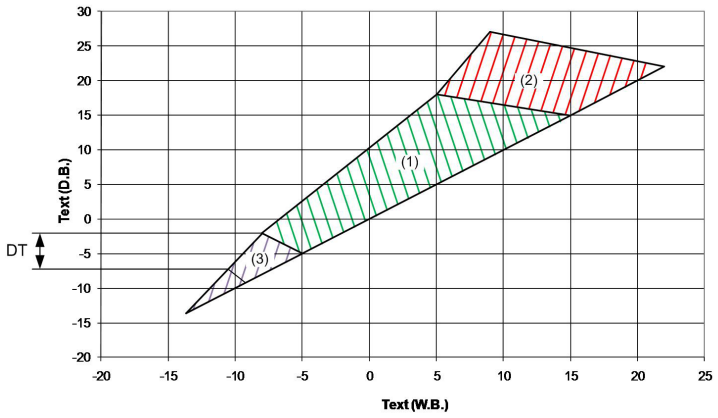
SIZE	16.2	20.4	22.4	24.4
9 kW	√	-	-	-
13,5 kW	√	-	-	-
18 kW	-	√	√	√
27 kW	-	√	√	√

⚠ This operation involves variation of the main electrical data of the unit.
⚠ Hot water coil, electric heaters and gas module cannot be mounted at the same time.
⚠ When selecting the unit, it must be checked that the overall heating capacity generated by the unit, complete with electric heaters, is suitable for maintaining the conditions of comfort in the served environment, based on outdoor conditions and the foreseen thermal loads. If the environment requires greater heating capacity, it is advisable to equip the unit with the hot water coil option or the gas heating module.

Extension of operating limits with heating heaters

SIZE	Air flow rate [m³/h]	Elecric heating capacity/ DT			
		9 kW	13,5 kW	18 kW	27 kW
16.2	4500	5,9	7,9	-	-
20.4	6000	-	-	8,9	13,3
22.4	7000	-	-	7,6	11,4
24.4	8000	-	-	6,7	10,0

The minimum operating temperature for the unit complete with the electric heaters varies based on the considered size and the power selected for the heaters. It can be easily obtained by subtracting the value DT (shown in the table below) from the lower limit of the temperature of the air entering the indoor exchanger TEXT(D.B.) for standard units, at the desired conditions.



The limits are indicative and take into consideration:
- general and non specific sizes
- Standard airflow
- operation at full load
- unit correctly installed and serviced

Text (D.B.) = Ambient air temperqature / handling coil inlet
CAUTION! dry bulb measured temperature (D.B.=DRY BULB)

Text (W.B.) = fresh air temperature/inlet of treatment coil
CAUTION! temperature measured with wet bulb
(W.B.=WET BULB)

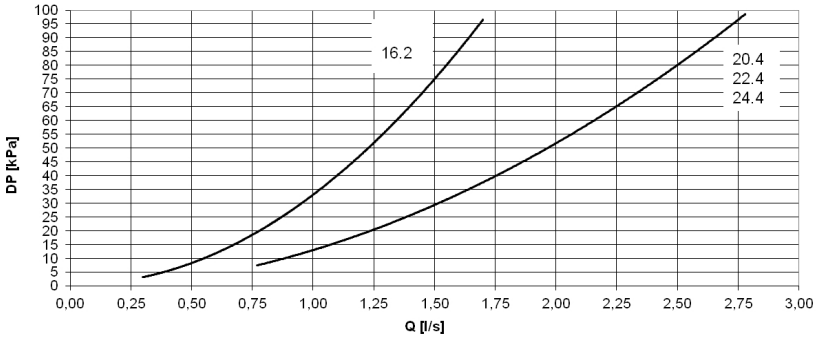
1. Operation range at full load
2. Operating field at partial load (one active compressor for each refrigerant circuit)
3. Operation range of the unit equipped with electric heaters

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 - 2 rows hot water coil" option.

HSE **Immersed electrodes steam humidifier**



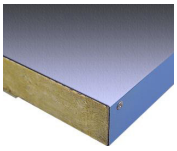
This device is suitable for winter operation when humidity is required for the ambient without cooling the air flow.
The automatic modulating control allows you to adjust the steam production and its relative management costs to the actual requirements.
Available in different capacities, the device is 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.
The ambient humidity control is performed by the ambient sensor equipped with an integrated humidity probe (standard with unit).

Matching of immersed electrode and steam humidification module

SIZE	16.2	20.4	22.4	24.4
3 kg/h	√	-	-	-
8 kg/h	√	√	√	√
15 kg/h	-	√	√	√

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

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/m^3) comply with the French standards, which require "M0" reaction to fire class.

LTEMP1

Application for low outdoor temperature

This option is necessary for very cold climates, where the fresh air temperature can be between -10°C and -20°C.
The option involves self-regulating heater thermostatically controlled able to protect the electrical panel from freezing, ensuring the correct operation. Usually located on the outer wall of the unit, the control keyboard is positioned inside the heated electrical panel to ensure quick response and to preserve the LCD from damage.



⚠ This option 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.
⚠ IMPORTANT! It is necessary to make precautions against build up of snow and ice in front of the exhaust and fresh air inlet locations.

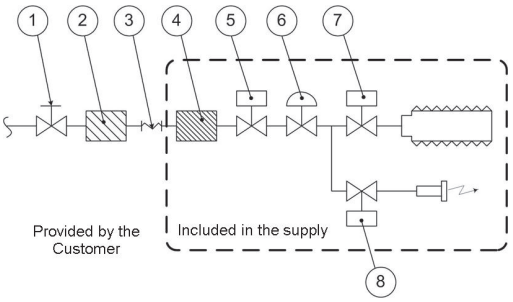
GC

Condensing gas heating module with modulating control

Option consisting of a combustion chamber and condensation burner with modulating control. It is available in various capacities and heats the environment served. The module can be chosen to integrate the heat pump or as an alternative to it. In this case, its heating capacity must be at least equal to the capacity envisioned in the project.
Thanks to the condensation technology with pre-mix and extremely efficient modulation (up to 105% depending on the lower heat value), consumption is very contained and considerably reduced during operation at partial load. The burner 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.
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

Matching of the condensing gas heating module

	CAPACITY	16.2	20.4	22.4	24.4
GC01X	35 kW	√	X	X	X
GC08X	44 kW	√	X	X	X
GC09X	65 kW	X	√	√	√
GC10X	82 kW	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). For further details, refer to the Installation, use and maintenance manual.
⚠ Electric elements', '2-row hot water coil' and 'Combustion heating module' cannot be assembled simultaneously.

Accessories

GC Gas use features

		35kW		44kW		65kW		82kW	
		min	max	min	max	min	max	min	max
Rated thermal input	kW	7,6	34,8	8,50	42,0	12,4	65,0	16,4	82,0
Efficiency Hi (P.C.I.)	%	107,0	96,3	105,9	96,2	108,1	96,8	108,4	97,6
Efficiency Hs (P.C.S.)	%	96,4	86,8	95,4	86,7	97,4	87,2	97,6	87,9
Max condensation produced	l/h	0,9		1,1		2,1		3,3	
Carbon monoxide CO (0% di O2)	ppm	<5		<5		<5		<5	
Nitrogen oxides - NOx (0% di O2)		41 mg / kWh 23 ppm		35 mg / kWh 20 ppm		40 mg / kWh 23 ppm		34 mg / kWh 19 ppm	
Available flue pressure	Pa	90		90		120		120	
Gas connection diameter	GAS	UNI ISO 228/1 - G 3/4"		UNI ISO 228/1 - G 3/4"		UNI ISO 228/1 - G 3/4"		UNI ISO 228/1 - G 3/4"	
Exhaust pipe diameter	mm	80		80		80		80	
Seasonal space heating energy efficiency [EU Reg./2281/2016] [ηs, h]	%	92,1		90,8		93,2		93,2	
Emission efficiency [EU Reg./2281/2016] [ηsflow]	%	97,3		97,0		97,4		97,1	
Power supply pressure (for gas G20)	mbar	20 [min 17-max 25]							
Gas consumption @15°C - 1013 mbar (for G20 gas)	m^3/h	0,8	3,69	0,9	4,44	1,31	6,88	1,74	8,68

CMSC9

Serial communication module for Modbus supervisor

This enables the serial connection of the supervision system, using Modbus RTU with serial port RS485 as the communication protocol. It enables access to the complete list of operational variables, commands and alarms. Using this accessory every unit can dialogue with the main supervision systems.
The device is installed and wired built-in the unit.

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

CMSC10

Serial communication module for LonWorks supervisor

It allows the serial connection to supervision systems, using Lonworks with serial port TP/FT-10 as the communication protocol. It allows access to a list of operating variables, control and alarms compliant with the Echelon standard.
The device is installed and wired built-in the unit.

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

CMSC11

Serial communication module for BACnet-IP supervisor

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

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

PGFC

Finned coil protection grilles

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

PGCCH

Anti-hail protection grilles

Option to install protective grilles on the external exchangers (source side). The grille has a protective function to prevent vandalism and to protect against atmospheric agents such as hail, without altering heat exchange. It consists of a rigid wire mesh with a 12.5 mm mesh pitch and RAL7073 grey protective paint.

PM

Phase monitor

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

PFCC

Power factor correction capacitors (cosfi > 0.95)

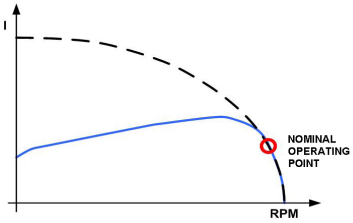


The component is necessary to lower the phase difference between current and voltage in the electromagnetic components of the unit, such as asynchronous motors. By re-phasing it is possible to reduce the intensity of the line current by reducing a part of the power of the mains (reactive power). This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

SFSTC

Progressive compressor start-up Soft starter

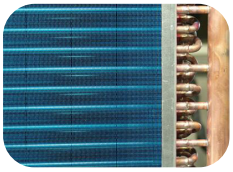
This option is also known as “Soft starter”. An electronic device which automatically starts up the compressors gradually, reducing the starting current for the unit by around 40% in comparison with the nominal value. This results in the electrical capacity system and the related protection devices being 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

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 re-heating coil - CPHG).
⚠ Water coil treatment (CHW2) available on request

CCCA1

Copper/aluminum coil with Fin Guard (Silver) treatment

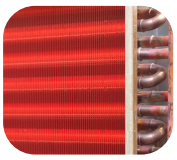


A treatment which offers an optimal thermal exchange and guarantees and protects the finned coil exchangers from corrosion over time. Can be used in settings with very aggressive saline concentrations and other chemical agents in the air thus maintaining the performance of the coils over time.

⚠ Option available on request.

CCCC

Copper / copper coil



Coils with copper pipes, copper fins and brass structure. Can be used in settings with moderately aggressive saline concentrations and other chemical agents. The options are available for:
- external coil;
- internal coil;
- hot water coil;
- re-heating coil.

⚠ This option is not suitable for application in sulphuric environments.
⚠ Option available on request.

Accessories

IOTI

IoT industrial module for cloud based interoperability & services

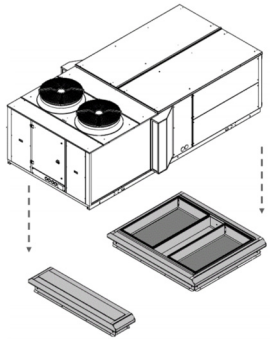
This device allows the monitoring and the remote control the unit via Clivet Eye, the supervision cloud system for Clivet units. With IoT module (i-LINK) it will be possible to monitor and manage the unit through the mobile app Clivet Eye and the dedicated web page.

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

- ⚠ IoT module to be provided for each unit to be remote monitored
- ⚠ Internet ethernet connection in charge of customer
- ⚠ Modbus interface (RS485) configuration is required
- ⚠ Clivet Eye management is alternative to an external BMS supervision system
- ⚠ Installation provided by the Customer.

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.

AMRX **Rubber antivibration mounts**
AMMRX **Rubber antivibration mounts for unit and gas module**

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



⚠ Installation provided by the Customer..

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

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



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

Performance

Cooling - Configuration: fresh air supply only (CBFFA)

SIZE	Airflow [m³/h]	FRESH AIR D.B / W.B. [°C]																	
		20/16						25/18						30/21					
		kWf	kWs	kWe	Td	Tw	EER	kWf	kWs	kWe	Td	Tw	EER	kWf	kWs	kWe	Td	Tw	EER
16.2	4000	43,3	21,5	8,3	4,5	1,9	5,22	45,3	24,1	9,5	7,3	4,0	4,77	47,1	25,4	10,9	11,1	8,1	4,32
	4500	44,2	22,6	8,6	5,5	3,5	5,14	46,4	25,4	9,9	8,4	5,6	4,69	48,3	26,8	11,3	12,2	9,5	4,27
	5300	45,5	24,0	8,4	6,9	5,4	5,42	47,8	27,3	9,6	9,9	7,5	4,98	49,8	28,8	11,1	13,8	11,3	4,49
20.4	5300	68,3	28,6	13,0	4,4	-1,7	5,25	70,8	32,2	15,0	7,2	0,6	4,72	73,2	34,3	17,3	10,7	5,0	4,23
	6000	70,0	30,1	13,1	5,5	0,4	5,34	72,7	34,2	15,1	8,3	2,7	4,81	75,1	36,4	17,4	11,9	7,0	4,32
	6500	71,0	31,1	13,2	6,2	1,7	5,38	73,8	35,5	15,2	9,0	3,9	4,86	76,2	37,9	17,5	12,6	8,1	4,35
22.4	6400	75,1	32,7	14,2	5,3	0,3	5,29	78,0	37,0	16,4	8,0	2,6	4,76	80,7	39,4	18,8	11,6	6,8	4,29
	7000	76,4	33,9	14,3	6,0	1,7	5,34	79,5	38,6	16,4	8,8	3,9	4,85	82,2	41,1	18,9	12,5	8,1	4,35
	7600	77,4	35,0	14,3	6,7	2,9	5,41	80,7	40,0	16,5	9,6	5,1	4,89	83,5	42,8	19,0	13,2	9,2	4,39
24.4	7300	81,1	36,3	15,3	5,7	1,4	5,30	84,3	41,1	17,7	8,5	3,6	4,76	87,4	43,8	20,2	12,1	7,8	4,33
	8000	82,3	37,6	15,4	6,4	2,7	5,34	86,0	42,8	17,7	9,3	4,9	4,86	89,0	45,7	20,4	13,0	9,0	4,36
	9000	83,9	39,4	15,5	7,4	4,2	5,41	87,8	45,1	17,9	10,3	10,1	4,91	90,9	48,2	20,5	14,0	10,4	4,43

SIZE	Airflow [m³/h]	FRESH AIR D.B / W.B. [°C]																	
		35/24						40/27						43/28					
		kWf	kWs	kWe	Td	Tw	EER	kWf	kWs	kWe	Td	Tw	EER	kWf	kWs	kWe	Td	Tw	EER
16.2	4000	48,3	26,3	12,4	15,0	12,3	3,90	48,9	26,7	14,5	19,4	16,6	3,37	48,7	28,1	15,8	21,1	18,0	3,08
	4500	49,5	27,8	12,9	16,2	13,6	3,84	50,4	28,1	15,0	20,7	17,6	3,36	50,1	29,4	16,2	22,6	18,9	3,09
	5300	51,2	29,8	12,6	17,9	15,1	4,06	52,2	30,1	14,7	22,4	18,8	3,55	52,0	31,8	15,9	24,3	20,2	3,27
20.4	5300	74,1	36,0	19,8	14,4	9,8	3,74	74,2	37,4	22,9	18,2	14,5	3,24	74,1	39,7	24,8	19,6	16,0	2,99
	6000	76,1	38,3	20,0	15,6	11,5	3,81	76,4	40,0	23,0	19,4	15,9	3,32	76,4	42,5	24,9	20,9	17,4	3,07
	6500	77,3	39,9	20,1	16,4	12,5	3,85	77,6	41,6	23,2	20,2	16,7	3,34	-	-	-	-	-	-
22.4	6400	82,0	41,4	21,5	15,4	11,3	3,81	82,2	43,0	24,8	19,2	15,7	3,31	81,6	45,7	26,9	20,7	17,3	3,03
	7000	83,4	43,3	21,7	16,2	12,5	3,84	83,7	45,1	24,9	20,1	16,7	3,36	-	-	-	-	-	-
	7600	84,7	45,0	21,8	17,0	13,4	3,89	85,3	46,9	25,0	20,9	17,5	3,41	-	-	-	-	-	-
24.4	7300	88,9	45,8	23,1	15,9	12,1	3,85	88,9	47,7	26,6	19,8	16,4	3,34	87,7	50,8	28,9	21,3	18,0	3,03
	8000	90,4	48,0	23,3	16,8	13,2	3,88	90,4	49,9	26,8	20,7	17,4	3,37	89,1	53,3	29,0	22,2	18,9	3,07
	9000	92,4	50,7	23,5	17,9	14,4	3,93	92,9	52,9	26,9	21,8	18,4	3,45	91,8	56,8	29,1	23,3	19,8	3,15

kWf = Evaporator power output [kW]
kWs = Evaporator sensible capacity [kW]
kWe = Electrical power absorbed by compressors (kW)
Td = Dry bulb temperature of internal exchanger leaving air [°C]
Tw = Wet bulb temperature of internal exchanger leaving air [°C]
EER referred only to compressors

Hesting - Configuration: fresh air supply only (CBFFA)

SIZE	Airflow [m³/h]	FRESH AIR D.B / W.B. [°C]																			
		-5/-6				0/-1				2/1				7/6				12/11			
		kWt	kWe	Td	COP	kWt	kWe	Td	COP	kWt	kWe	Td	COP	kWt	kWe	Td	COP	kWt	kWe	Td	COP
16.2	4000	39,0	7,8	20,6	5,00	43,6	9,6	29,2	4,54	45,4	10,5	32,7	4,32	49,1	12,9	40,7	3,81	53,5	16,7	49,6	3,20
	4500	39,1	7,2	17,8	5,43	44,0	9,0	26,2	4,89	45,9	9,8	29,6	4,68	50,0	11,9	37,5	4,20	54,1	14,9	45,8	3,63
	5300	39,4	6,6	14,5	5,97	44,2	8,1	22,4	5,46	46,3	8,8	25,6	5,26	50,8	10,7	33,3	4,75	54,7	13,0	41,0	4,21
20.4	5300	57,1	11,2	23,3	5,10	64,2	14,2	32,5	4,52	66,6	15,4	36,0	4,32	72,2	18,9	44,4	3,82	77,5	24,0	53,2	3,23
	6000	57,3	10,2	20,0	5,62	64,2	12,9	28,7	4,98	66,9	14,0	32,2	4,78	73,2	17,2	40,5	4,26	78,6	21,2	48,9	3,71
	6500	-	-	-	-	64,6	12,1	26,7	5,34	67,4	13,2	30,0	5,11	73,8	16,2	38,2	4,56	79,1	19,9	46,2	3,97
22.4	6400	63,3	11,5	20,9	5,50	71,2	14,4	29,9	4,94	74,1	15,8	33,3	4,69	80,6	19,4	41,6	4,15	86,2	24,2	49,9	3,56
	7000	-	-	-	-	71,1	13,5	27,3	5,27	74,3	14,8	30,7	5,02	81,4	18,2	38,9	4,47	87,3	22,3	47,1	3,91
	7600	-	-	-	-	71,5	12,9	25,2	5,54	74,6	14,1	28,5	5,29	81,9	17,2	36,6	4,76	88,1	21,0	44,6	4,20
24.4	7300	69,5	12,4	20,0	5,60	78,0	15,5	28,7	5,03	81,3	17,0	32,1	4,78	88,4	20,8	40,3	4,25	94,7	25,6	48,5	3,70
	8000	69,7	12,1	17,8	5,76	78,0	15,2	26,2	5,13	81,7	16,8	29,6	4,86	89,5	20,6	37,7	4,34	96,0	25,3	45,8	3,79
	9000	70,1	10,9	15,4	6,43	78,6	13,7	23,4	5,74	82,0	14,9	26,6	5,50	90,3	18,3	34,6	4,93	97,3	22,1	42,4	4,40

kWt = Condenser power output [kW]
kWe = Electrical power absorbed by compressors (kW)
Td = Dry bulb temperature of internal exchanger leaving air [°C]
COP referred only to compressors
Not all thermal yields take into account the heat dissipated by the fan motors

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 fresh air temperature with a long period of heat pump operating mode it is necessary to help the evacuation of the water produced during the defrost cycle; this to avoid the formation of ice in the unit basement. Pay attention that the evacuation will not create inconveniences to things or persons.

Handling electric fan performance - Standard airflow

Available static pressure (Pa) (supply)			90	100	120	150	180	210	240	270	300	330	360	390	420	450	510	570	630	690	750
	Airflow	m^3/h	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	-	-	-	-	-
	Airflow	l/s	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	-	-	-	-	-
16.2	Fan RPM	rpm	1635	1646	1668	1701	1734	1768	1800	1833	1864	1898	1931	1963	1995	2027	-	-	-	-	-
	Sound power	dB(A)	83,6	83,4	83,1	82,8	82,4	82,2	81,9	81,7	81,6	81,8	82	82,2	82,4	82,6	-	-	-	-	-
	Total input	kW	0,62	0,63	0,66	0,71	0,75	0,81	0,86	0,91	0,97	1,02	1,07	1,13	1,18	1,24	-	-	-	-	-
	Airflow	m^3/h	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
	Airflow	l/s	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667
20.4	Fan RPM	rpm	915	927	952	988	1024	1059	1094	1129	1162	1196	1228	1260	1291	1321	1381	1440	1497	1553	1607
	Sound power	dB(A)	72,9	73	73	73	73,1	73,3	74	74,7	75,3	76	76,9	77,8	78,6	79,3	80,8	82,2	83,6	84,9	86,1
	Total input	kW	0,54	0,57	0,61	0,67	0,74	0,81	0,88	0,96	1,04	1,12	1,21	1,29	1,38	1,47	1,67	1,87	2,07	2,27	2,49
	Airflow	m^3/h	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	-
	Airflow	l/s	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	-
22.4	Fan RPM	rpm	1023	1034	1054	1086	1117	1149	1180	1210	1240	1270	1300	1329	1358	1387	1442	1496	1548	1600	-
	Sound power	dB(A)	75,6	75,7	76	76,4	76,4	76,4	76,4	76,5	76,7	77,2	77,7	78,2	78,7	79,2	80,5	81,7	82,8	83,9	-
	Total input	kW	0,71	0,73	0,79	0,87	0,94	1,01	1,09	1,16	1,25	1,33	1,42	1,52	1,61	1,71	1,91	2,12	2,33	2,56	-
	Airflow	m^3/h	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	-	-
	Airflow	l/s	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	-	-
24.4	Fan RPM	rpm	1137	1146	1164	1191	1218	1246	1273	1301	1328	1355	1382	1408	1434	1460	1512	1563	1612	-	-
	Sound power	dB(A)	78,1	78,2	78,4	78,7	79,1	79,3	793	79,3	79,3	79,3	79,4	79,5	79,9	80,3	79,8	81,8	82,7	-	-
	Total input	kW	0,92	0,94	1	1,09	1,18	1,27	1,35	1,43	1,52	1,61	1,7	1,79	1,89	1,99	2,2	2,43	2,66	-	-

The performance takes into account the pressure drops in the unit (pressure drops in treatment 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)			90	100	120	150	180	210	240	270	300	330	360	390	420	450	510	570	630	690	750	800
	Airflow	m^3/h	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	-	-	-	-
	Airflow	l/s	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	-	-	-	-
16.2	Fan RPM	rpm	1503	1514	1528	1564	1602	1639	1676	1711	1746	1783	1819	1852	1887	1921	1985	2047	-	-	-	-
	Sound power	dB(A)	80,5	80,4	80,2	79,9	79,6	79,4	79,3	79,5	79,9	80,2	80,4	80,7	81	81,2	81,7	82,3	-	-	-	-
	Total input	kW	0,51	0,52	0,00	0,58	0,63	0,68	0,73	0,77	0,82	0,86	0,91	0,96	1,01	1,07	1,18	1,29	-	-	-	-
	Airflow	m^3/h	5300	5300	5300	5300	5300	5300	5300	5300	5300	5300	5300	5300	5300	5300	5300	5300	5300	5300	5300	5300
	Airflow	l/s	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472
20.4	Fan RPM	rpm	843	857	884	925	964	1003	1041	1078	1114	1149	1183	1217	1251	1284	1348	1410	1470	1528	1584	1629
	Sound power	dB(A)	70,3	70,3	70,4	70,4	71,2	72	72,8	73,9	75,1	76,1	77	78	79	79,9	81,6	83,2	84,7	86	87,3	88,2
	Total input	kW	0,44	0,46	0,50	0,56	0,62	0,69	0,77	0,84	0,92	1,00	1,08	1,16	1,25	1,34	1,51	1,70	1,89	2,09	2,31	2,49
	Airflow	m^3/h	6400	6400	6400	6400	6400	6400	6400	6400	6400	6400	6400	6400	6400	6400	6400	6400	6400	6400	6400	-
	Airflow	l/s	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778	-
22.4	Fan RPM	rpm	958	969	992	1027	1061	1095	1128	1160	1193	1,23	1,26	1,29	1317	1347	1405	1461	1516	1571	1623	-
	Sound power	dB(A)	74	74,2	74,4	74,4	74,4	74,5	74,6	75,3	75,9	76,5	77	77,7	78,5	79,2	80,6	81,9	83,2	84,4	85,6	-
	Total input	kW	0,60	0,63	0,68	0,74	0,80	0,88	0,96	1,03	1,12	1,20	1,29	1,38	1,47	1,56	1,76	1,96	2,18	2,39	2,61	-
	Airflow	m^3/h	7300	7300	7300	7300	7300	7300	7300	7300	7300	7300	7300	7300	7300	7300	7300	7300	7300	7300	-	-
	Airflow	l/s	2028	2028	2028	2028	2028	2028	2028	2028	2028	2028	2028	2028	2028	2028	2028	2028	2028	2028	-	-
24.4	Fan RPM	rpm	1057	1067	1087	1117	1148	1178	1208	1237	1266	1295	1324	1352	1380	1408	1463	1516	1567	1617	-	-
	Sound power	dB(A)	76,4	76,5	76,8	77,2	77,3	77,3	77,3	77,3	77,4	77,7	78,1	78,6	79	79,5	80,5	81,6	82,7	83,8	-	-
	Total input	kW	0,77	0,79	0,85	0,93	1,01	1,08	1,16	1,24	1,32	1,41	1,50	1,59	1,69	1,79	2,00	2,21	2,43	2,66	-	-

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

Handling electric fan performance - High airflow

Available static pressure (Pa) (supply)			90	100	120	150	180	210	240	270	300	330	360	390	420	450	510	570	630	690	750
	Airflow	m^3/h	5300	5300	5300	5300	5300	5300	5300	5300	-	-	-	-	-	-	-	-	-	-	-
	Airflow	l/s	1472	1472	1472	1472	1472	1472	1472	1472	-	-	-	-	-	-	-	-	-	-	-
16.2	Fan RPM	rpm	1873	1884	1905	1935	1963	1991	2020	2048	-	-	-	-	-	-	-	-	-	-	-
	Sound power	dB(A)	87,4	87,3	87,3	87,1	86,7	86,5	86,2	85,9	-	-	-	-	-	-	-	-	-	-	-
	Total input	kW	0,86	0,88	0,92	0,97	1,02	1,08	1,14	1,20	-	-	-	-	-	-	-	-	-	-	-
	Airflow	m^3/h	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500
	Airflow	l/s	1806	1806	1806	1806	1806	1806	1806	1806	1806	1806	1806	1806	1806	1806	1806	1806	1806	1806	1806
20.4	Fan RPM	rpm	968	979	1002	1036	1070	1103	1136	1168	1200	1231	1262	1293	1323	1353	1410	1466	1521	1575	1627
	Sound power	dB(A)	74,2	74,4	74,8	74,7	74,8	74,8	74,9	75,4	76,0	76,6	77,1	77,7	78,5	79,2	80,6	81,9	83,1	84,3	85,5
	Total input	kW	0,62	0,64	0,70	0,76	0,83	0,90	0,97	1,05	1,13	1,22	1,31	1,40	1,49	1,58	1,78	1,98	2,20	2,42	2,64
	Airflow	m^3/h	7600	7600	7600	7600	7600	7600	7600	7600	7600	7600	7600	7600	7600	7600	7600	7600	7600	7600	-
	Airflow	l/s	2111	2111	2111	2111	2111	2111	2111	2111	2111	2111	2111	2111	2111	2111	2111	2111	2111	2111	-
22.4	Fan RPM	rpm	1091	1100	1119	1148	1177	1206	1235	1264	1292	1320	1348	1375	1402	1430	1483	1535	1586	1635	-
	Sound power	dB(A)	77,1	77,2	77,5	77,9	78,2	78,1	78,1	78,2	78,2	78,3	78,5	79,0	79,4	79,8	80,6	81,6	82,7	83,7	-
	Total input	kW	0,83	0,85	0,91	0,99	1,08	1,16	1,23	1,32	1,40	1,49	1,58	1,67	1,77	1,87	2,08	2,30	2,52	2,75	-
	Airflow	m^3/h	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	-	-	-	-
	Airflow	l/s	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	-	-	-	-
24.4	Fan RPM	rpm	1251	1259	1275	1299	1323	1348	1372	1397	1421	1446	1470	1495	1519	1542	1589	-	-	-	-
	Sound power	dB(A)	80,5	80,5	80,6	80,9	81,1	81,4	81,7	81,8	81,8	81,8	81,8	81,8	81,9	81,9	82,1	-	-	-	-
	Total input	kW	1,17	1,20	1,26	1,35	1,45	1,55	1,66	1,76	1,85	1,94	2,04	2,13	2,24	2,34	2,55	-	-	-	-

The performance takes into account the pressure drops in the unit (pressure drops in treatment 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)			300	360	420	480	540	600	660	720	780	840	900	960	1020	1080	1140	1200	1260	1320
	Airflow	m^3/h	4500	4500	4500	4500	4500	4500	4500	4500	4500	-	-	-	-	-	-	-	-	-
	Airflow	l/s	1250	1250	1250	1250	1250	1250	1250	1250	1250	-	-	-	-	-	-	-	-	-
16.2	Fan RPM	rpm	1192	1256	1318	1378	1435	1491	1545	1597	1647	-	-	-	-	-	-	-	-	-
	Sound power	dB(A)	76,8	77,9	79,2	80,4	81,6	82,7	83,8	84,8	85,8	-	-	-	-	-	-	-	-	-
	Total input	kW	0,92	1,05	1,19	1,33	1,47	1,63	1,78	1,95	2,12	-	-	-	-	-	-	-	-	-
	Airflow	m^3/h	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
	Airflow	l/s	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667
20.4	Fan RPM	rpm	1271	1331	1389	1445	1501	1554	1607	1658	1708	1757	1805	1853	1899	1945	1990	2034	2077	2119
	Sound power	dB(A)	83,9	84,5	85,2	85,9	86,7	87,4	88,2	89,1	89,9	90,8	91,6	92,4	93,2	94,0	94,7	95,4	96,1	96,7
	Total input	kW	1,12	1,28	1,44	1,60	1,77	1,95	2,13	2,31	2,49	2,69	2,88	3,09	3,30	3,51	3,74	3,95	4,17	4,39
	Airflow	m^3/h	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000
	Airflow	l/s	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944
22.4	Fan RPM	rpm	1377	1431	1484	1536	1586	1636	1684	1731	1778	1823	1868	1912	1956	1999	2041	2082	2123	2164
	Sound power	dB(A)	86,4	86,8	87,2	87,7	88,2	88,7	89,2	89,8	90,3	90,9	91,4	92,1	92,7	93,4	94,0	94,6	95,2	95,8
	Total input	kW	1,36	1,53	1,71	1,89	2,07	2,26	2,45	2,64	2,85	3,06	3,28	3,49	3,70	3,92	4,15	4,38	4,62	4,87
	Airflow	m^3/h	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	-
	Airflow	l/s	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	-
24.4	Fan RPM	rpm	1493	1541	1589	1637	1683	1728	1773	1817	1860	1903	1945	1986	2027	2067	2106	2145	2184	-
	Sound power	dB(A)	89,0	89,1	89,4	89,7	90,0	90,4	90,7	91,1	91,5	91,9	92,3	92,7	93,2	93,6	94,0	94,5	95,0	-
	Total input	kW	1,66	1,84	2,03	2,22	2,42	2,62	2,84	3,05	3,26	3,47	3,70	3,93	4,17	4,41	4,66	4,91	5,16	-

The performance takes into account the pressure drops in the unit (pressure drops in treatment 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

Performance

High static pressure electric fan performance - Minimum airflow

Available static pressure (Pa) (supply)			420	480	540	600	660	720	780	840	900	960	1020	1080	1140	1200	1260	1320
	Airflow	m^3/h	4000	4000	4000	4000	4000	4000	4000	4000	-	-	-	-	-	-	-	-
	Airflow	l/s	1111	1111	1111	1111	1111	1111	1111	1111	-	-	-	-	-	-	-	-
16.2	Fan RPM	rpm	1277	1339	1399	1456	1511	1565	1616	1667	-	-	-	-	-	-	-	-
	Sound power	dB(A)	79,1	80,5	81,8	83,0	84,2	85,3	86,3	87,2	-	-	-	-	-	-	-	-
	Total input	kW	1,05	1,19	1,33	1,47	1,62	1,77	1,92	2,08	-	-	-	-	-	-	-	-
	Airflow	m^3/h	5300	5300	5300	5300	5300	5300	5300	5300	5300	5300	5300	5300	5300	5300	5300	5300
	Airflow	l/s	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472
20.4	Fan RPM	rpm	1329	1390	1449	1506	1561	1615	1668	1721	1771	1820	1868	1915	1962	2007	2051	2094
	Sound power	dB(A)	84,0	85,0	86,1	87,2	88,2	89,3	90,3	91,3	92,2	93,1	93,9	94,7	95,5	96,2	96,8	97,5
	Total input	kW	1,28	1,43	1,59	1,76	1,92	2,10	2,28	2,47	2,66	2,84	3,04	3,23	3,43	3,64	3,85	4,06
	Airflow	m^3/h	6400	6400	6400	6400	6400	6400	6400	6400	6400	6400	6400	6400	6400	6400	6400	6400
	Airflow	l/s	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778
22.4	Fan RPM	rpm	1426	1480	1534	1586	1636	1686	1735	1782	1829	1875	1920	1965	2009	2052	2095	2137
	Sound power	dB(A)	86,0	86,6	87,2	87,9	88,5	89,2	89,9	90,7	91,4	92,2	92,9	93,6	94,3	95,0	95,7	96,3
	Total input	kW	1,55	1,71	1,89	2,06	2,25	2,45	2,64	2,83	3,03	3,24	3,45	3,66	3,89	4,12	4,36	4,59
	Airflow	m^3/h	7300	7300	7300	7300	7300	7300	7300	7300	7300	7300	7300	7300	7300	7300	7300	7300
	Airflow	l/s	2028	2028	2028	2028	2028	2028	2028	2028	2028	2028	2028	2028	2028	2028	2028	2028
24.4	Fan RPM	rpm	1515	1566	1614	1663	1710	1756	1802	1846	1890	1934	1976	2018	2059	2100	2140	2,18
	Sound power	dB(A)	87,9	88,3	88,7	89,2	89,6	90,1	90,6	91,2	91,7	92,2	92,7	93,3	93,9	94,5	95,1	95,6
	Total input	kW	1,80	1,98	2,18	2,37	2,56	2,76	2,96	3,18	3,40	3,62	3,85	4,07	4,30	4,53	4,77	5,02

The performance takes into account the pressure drops in the unit (pressure drops in treatment 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)			240	270	300	330	360	390	420	480	540	600	660	720	780	840	900	960	1020	1080
	Airflow	m^3/h	5300	5300	5300	5300	5300	5300	5300	5300	5300	5300	5300	5300	-	-	-	-		
	Airflow	l/s	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	-	-	-	-	-	-
16.2	Fan RPM	rpm	1221	1251	1280	1309	1337	1365	1393	1448	1502	1554	1605	1655	-	-	-	-	-	-
	Sound power	dB(A)	77,8	78,1	78,4	78,8	79,3	79,7	80,2	81,0	81,8	82,7	83,7	84,5	-	-	-	-	-	-
	Total input	kW	0,99	1,07	1,14	1,21	1,28	1,36	1,43	1,59	1,75	1,91	2,08	2,25	-	-	-	-	-	-
	Airflow	m^3/h	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500
	Airflow	l/s	1806	1806	1806	1806	1806	1806	1806	1806	1806	1806	1806	1806	1806	1806	1806	1806	1806	1806
20.4	Fan RPM	rpm	1264	1293	1323	1351	1380	1407	1435	1489	1542	1593	1643	1693	1741	1788	1835	1880	1925	1970
	Sound power	dB(A)	84,7	84,9	85,1	85,4	85,6	85,9	86,2	86,7	87,3	88,0	88,6	89,3	89,9	90,7	91,4	92,1	92,8	93,5
	Total input	kW	1,08	1,16	1,24	1,32	1,40	1,48	1,57	1,74	1,91	2,09	2,28	2,48	2,68	2,87	3,07	3,27	3,48	3,70
	Airflow	m^3/h	7600	7600	7600	7600	7600	7600	7600	7600	7600	7600	7600	7600	7600	7600	7600	7600	7600	7600
	Airflow	l/s	2111	2111	2111	2111	2111	2111	2111	2111	2111	2111	2111	2111	2111	2111	2111	2111	2111	2111
22.4	Fan RPM	rpm	1394	1420	1445	1471	1496	1521	1546	1595	1643	1690	1736	1781	1826	1870	1913	1955	1997	2038
	Sound power	dB(A)	87,9	87,9	87,9	88,0	88,2	88,3	88,5	88,9	89,3	89,7	90,1	90,5	91,0	91,4	91,9	92,4	92,9	93,4
	Total input	kW	1,36	1,45	1,54	1,62	1,71	1,80	1,89	2,08	2,27	2,48	2,67	2,87	3,08	3,30	3,52	3,75	3,98	4,22
	Airflow	m^3/h	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000
	Airflow	l/s	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
24.4	Fan RPM	rpm	1571	1593	1614	1636	1658	1679	1701	1744	1787	1829	1871	1911	1951	1991	2030	2069	2107	2145
	Sound power	dB(A)	91,8	91,8	91,7	91,6	91,6	91,6	91,5	91,7	91,9	92,2	92,4	92,7	93,0	93,3	93,6	93,9	94,2	94,5
	Total input	kW	1,83	1,92	2,01	2,11	2,21	2,31	2,41	2,61	2,82	3,03	3,26	3,49	3,72	3,97	4,21	4,45	4,69	4,94

The performance takes into account the pressure drops in the unit (pressure drops in treatment 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

Extraction and exhaust electric fan performances - 50% exhaust air

Available static pressure (Pa) (extraction/exhaust)			60	90	120	150	180	210	240	270	300	330	360	390	420
	Airflow	m3/h	2250	2250	2250	2250	2250	2250	2250	2250	2250	2250	2250	2250	2250
	Airflow	l/s	625	625	625	625	625	625	625	625	625	625	625	625	625
16.2	Fan RPM	rpm	934	1000	1061	1119	1176	1232	1285	1336	1386	1434	1480	1526	1570
	Sound power	dB(A)	66,5	67,4	68,2	69	70	71,1	72	73	73,8	74,7	75,5	76,4	77,2
	Total input	kW	0,18	0,21	0,24	0,28	0,31	0,34	0,38	0,41	0,45	0,49	0,52	0,56	0,59
	Airflow	m3/h	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	Airflow	l/s	833	833	833	833	833	833	833	833	833	833	833	833	833
20.4	Fan RPM	rpm	650	702	754	803	850	896	940	983	1023	1063	1100	1137	1173
	Sound power	dB(A)	64,6	65,6	66,8	68,2	69,4	70,9	72,3	73,6	74,8	75,9	77	78,1	79
	Total input	kW	0,19	0,23	0,28	0,32	0,37	0,41	0,46	0,51	0,56	0,61	0,67	0,72	0,78
	Airflow	m3/h	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500
	Airflow	l/s	972	972	972	972	972	972	972	972	972	972	972	972	972
22.4	Fan RPM	rpm	701	748	794	839	882	924	966	1006	1045	1083	1120	1156	1191
	Sound power	dB(A)	67,6	67,8	68,6	69,3	70,3	71,2	72,2	73,2	74,2	75,3	76,2	77,2	78,1
	Total input	kW	0,22	0,27	0,31	0,37	0,41	0,46	0,52	0,57	0,62	0,68	0,73	0,79	0,85
	Airflow	m3/h	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
	Airflow	l/s	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111
24.4	Fan RPM	rpm	765	807	848	889	929	968	1005	1042	1079	1115	1150	1184	1218
	Sound power	dB(A)	70,4	70,5	70,6	71,2	71,8	72,3	73,1	73,9	74,6	75,3	76,1	76,9	77,7
	Total input	kW	0,26	0,31	0,37	0,42	0,47	0,53	0,58	0,64	0,7	0,76	0,82	0,88	0,94

50% EXHAUST AIR = Extraction and exhaust air flow equal to 50% of the supply flow

Extraction and exhaust electric fan performances - 100% exhaust air

Available static pressure (Pa) (extraction/exhaust)			60	90	120	150	180	210	240	270	300	330	360	390	420
	Airflow	m3/h	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
	Airflow	l/s	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250
16.2	Fan RPM	rpm	1530	1566	1603	1639	1672	1706	1739	1772	1805	1837	1869	1902	1935
	Sound power	dB(A)	84,4	84,1	83,8	83,5	83,1	82,7	82,4	82,1	81,9	81,7	81,5	81,8	82
	Total input	kW	0,48	0,53	0,57	0,62	0,66	0,71	0,76	0,81	0,87	0,92	0,98	1,03	1,08
	Airflow	m3/h	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
	Airflow	l/s	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667
20.4	Fan RPM	rpm	1010	1044	1078	1110	1141	1170	1198	1226	1253	1280	1307	1334	1340
	Sound power	dB(A)	79,7	79,5	79,3	79,2	79,2	79,2	79,3	79,3	79,4	79,5	79,8	80	80,3
	Total input	kW	0,52	0,58	0,63	0,69	0,75	0,82	0,89	0,96	1,04	1,12	1,19	1,27	1,34
	Airflow	m3/h	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000
	Airflow	l/s	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944
22.4	Fan RPM	rpm	1148	1178	1208	1237	1266	1293	1320	1345	1370	1394	1418	1441	1465
	Sound power	dB(A)	82,9	83	82,9	82,8	82,7	82,6	82,5	82,5	82,6	82,6	82,6	82,7	82,7
	Total input	kW	0,71	0,79	0,86	0,92	0,99	1,05	1,12	1,2	1,28	1,36	1,45	1,54	1,63
	Airflow	m3/h	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000
	Airflow	l/s	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222
24.4	Fan RPM	rpm	1288	1315	1342	1368	1394	1419	1444	1468	1491	1514	1537	1558	1580
	Sound power	dB(A)	85,8	85,8	85,9	85,9	85,7	85,6	84,8	85,5	85,4	85,4	85,4	85,5	85,5
	Total input	kW	0,96	1,05	1,13	1,21	1,28	1,36	1,43	1,51	1,59	1,67	1,76	1,86	1,95

100% EXHAUST AIR = Extraction and exhaust air flow equal to 100% of the supply flow

Dimensional drawings

Functional spaces

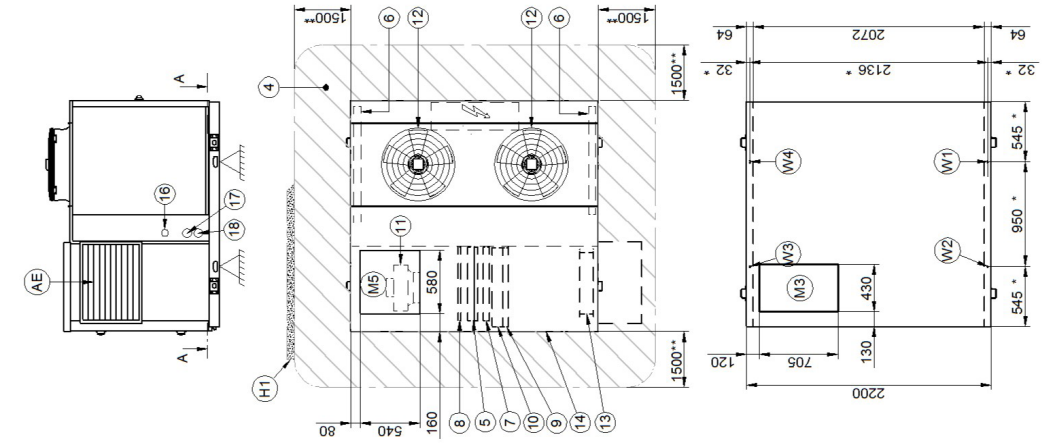
When placing the unit, it is necessary to comply with the functional spaces indicated in the dimensions. Compliance with functional spaces is essential to:

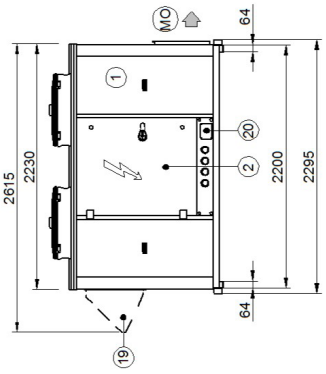
- ensure proper operation of the unit;
- allow maintenance technicians easy access to the equipment compartments;
- protect authorized operators and exposed persons.

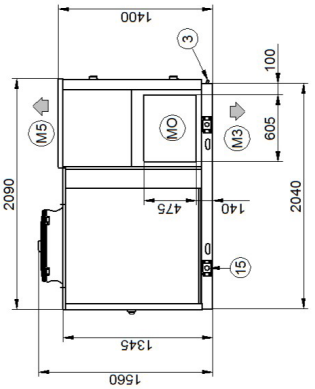
If several units are placed near one another, the functional spaces between units must be doubled.

Size 16.2 - CBFFA configuration

DAA7Z12.2_16.2_CBFFA_02
Date13/02/2018







1. Compressor compartment
2. Electrical panel
3. Condensate drain
4. Functional spaces
5. Internal exchanger
6. External exchanger
7. H2O heating coil / Electric heaters (Otional)
8. Reheat coil (Optional)
9. G4 air filters (Standard)
10. F7 / F9 / electronic filters (optional)
11. Electric fan (Supply)
12. External electric fan
13. Fresh air damper
14. Access for inspection of coils- filters - heating elements
15. Lifting brackets (removable)
16. Humidifier connections
17. H2O heating coil input Ø 3/4"
18. H2O heating coil output Ø 3/4"
19. Outdoor Air Return Cap (Optional) Accessory Separately Supplied
20. Power Input

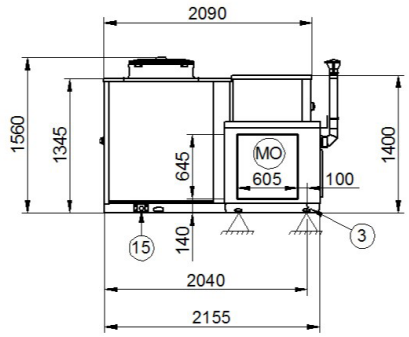
(M0) Horizontal air supply
(M3) Downward air supply (Optional)
(M5) Upflow air supply (Optional)
(AE) Fresh air inlet
(H1) Wall with same height as unit on a maximum of three sides
(*) Anti-vibration mount position
(**) Suggested minimum clearance

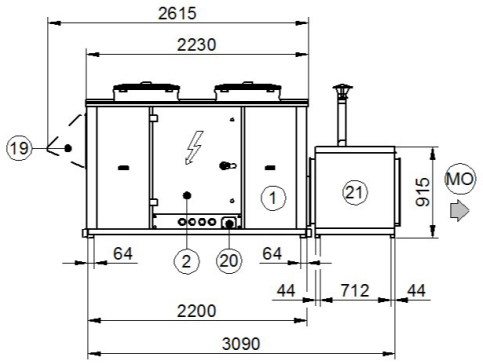
SIZE		16.2
W1 Supporting point	kg	360
W2 Supporting point	kg	268
W3 Supporting point	kg	291
W4 Supporting point	kg	378
Operating weight	kg	1297
Shipping weight	kg	1297

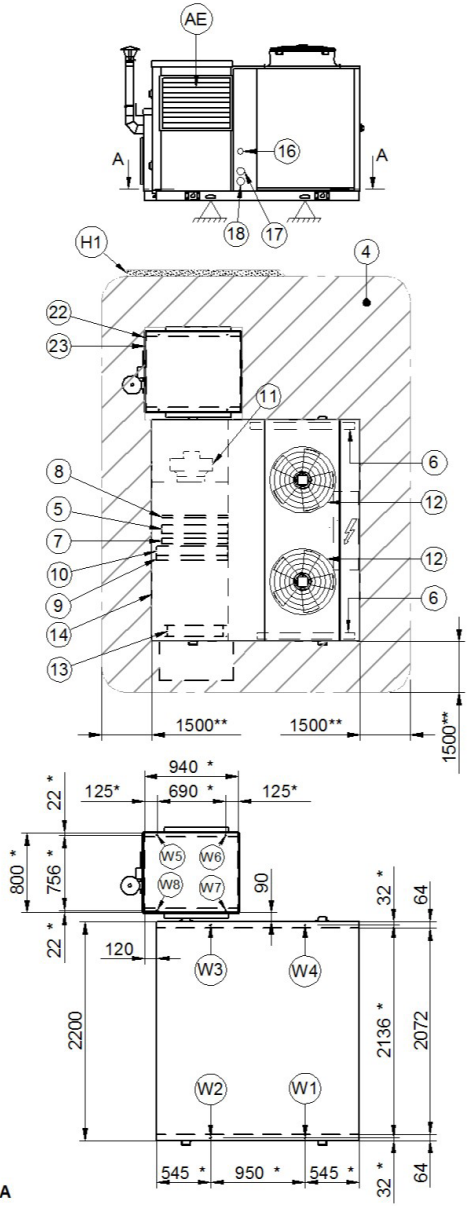
The presence of optional accessories may result in a substantial variation of the weights shown in the table

Size 16.2 Combustion module - CBFFA configuration

Dimensional drawings







Sez. A-A

1. Compressor compartment
2. Electrical panel
3. Condensate drain
4. Functional spaces
5. Internal exchanger
6. External exchanger
7. H2O heating coil / Electric heaters (Otional)
8. Reheat coil (Optional)
9. G4 air filters (Standard)
10. F7 / F9 / electronic filters (optional)
11. Electric fan (Supply)
12. External electric fan
13. Fresh air damper
14. Access for inspection of coils- filters - heating elements
15. Lifting brackets (removable)
16. Humidifier connections
17. H2O heating coil input Ø 3/4"
18. H2O heating coil output Ø 3/4"
19. Outdoor air return cap (optional) accessory separately supplied
20. Power input
21. Gas module (accessory separately supplied)
22. Gas connection UNI ISO 228/1 - G 3/4"
23. Condensate drain (only for condensation gas heating module)

(M0) Horizontal air supply
(AE) Fresh air inlet
(H1) Wall with same height as unit on a maximum of three sides
(*) Anti-vibration mount position
(**) Suggested minimum clearance

SIZE		16.2
W1 Supporting point	kg	360
W2 Supporting point	kg	268
W3 Supporting point	kg	291
W4 Supporting point	kg	378
Operating weight	kg	1297
Shipping weight	kg	1297

GAS MODULE WEIGHT DISTRIBUTION

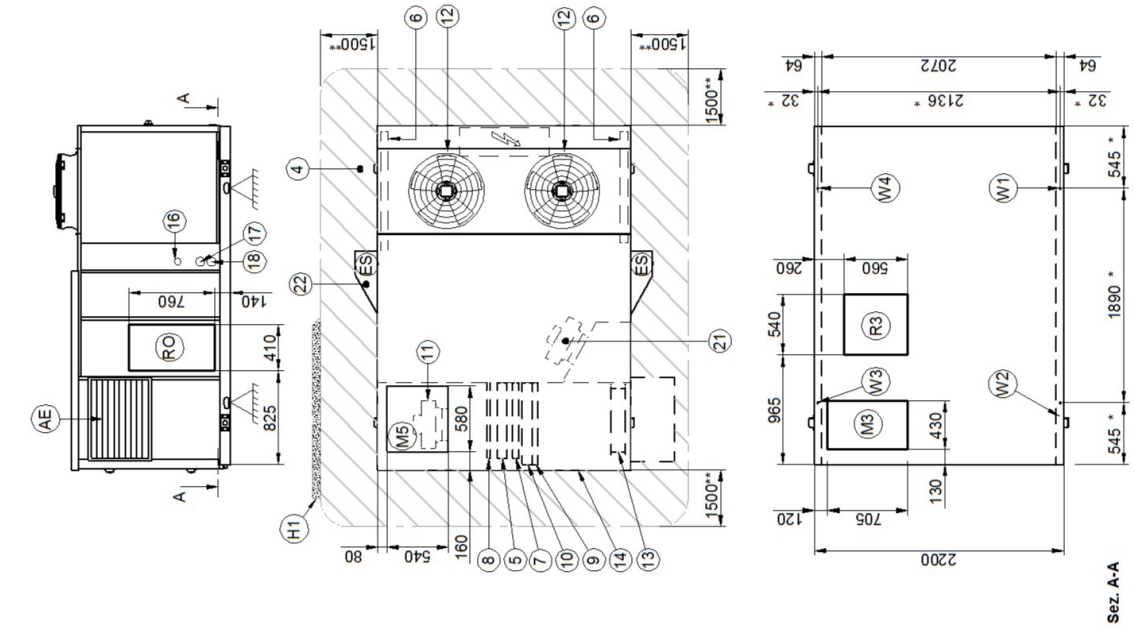
SIZE		16.2
W5 Supporting point	kg	70
W6 Supporting point	kg	58
W7 Supporting point	kg	58
W8 Supporting point	kg	70
Operating weight	kg	256
Shipping weight	kg	256

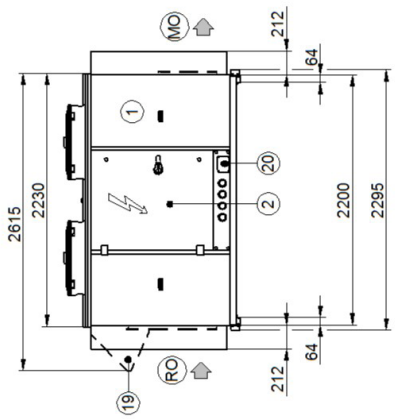
The presence of optional accessories may result in a substantial variation of the weights shown in the table

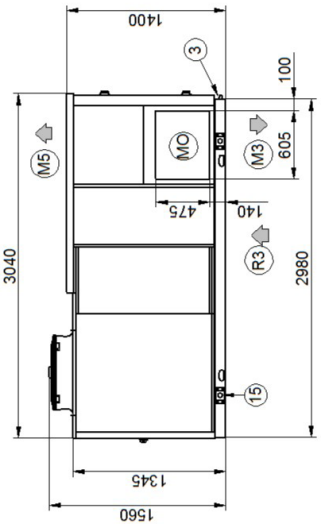
Dimensional drawings

Size 16.2 - CCFFA configuration

DAA7Z12.2_16.2_CCFFA_02
Date13/02/2018







1. Compressor compartment
2. Electrical panel
3. Condensate drain
4. Functional spaces
5. Internal exchanger
6. External exchanger
7. H2O heating coil / Electric heaters (Otional)
8. Reheat coil (Optional)
9. G4 air filters (Standard)
10. F7 / F9 / electronic filters (optional)
11. Electric fan (Supply)
12. External electric fan
13. Fresh air damper
14. Access for inspection of coils- filters - heating elements
15. Lifting brackets (removable)
16. Humidifier connections
17. H2O heating coil input Ø 3/4"
18. H2O heating coil output Ø 3/4"
19. Air intake cap (optional) accessory separately supplied
20. Power input
21. Exhaust electric fan
22. Air exhaust caps (accessory separately supplied

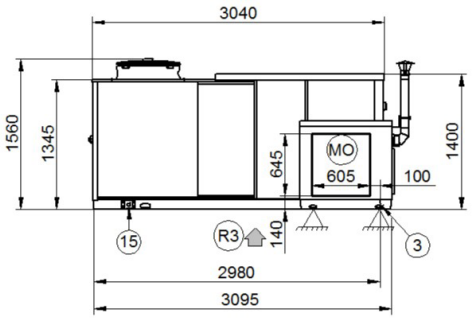
(ES) Air exhaust
(R0) Horizontal return
(R3) Downward air return
(M0) Horizontal air supply
(M3) Downward air supply (Optional)
(M5) Upflow air supply (Optional)
(AE) Fresh air inlet
(H1) Wall with same height as unit on a maximum of three sides
(*) Anti-vibration mount position
(**) Suggested minimum clearance

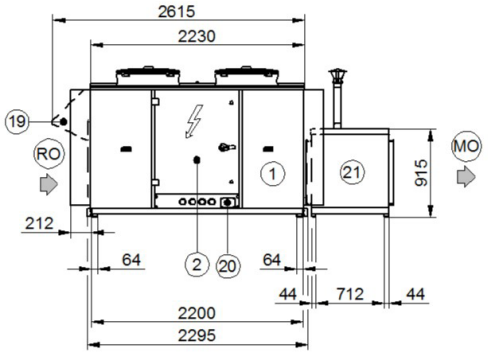
SIZE		16.2
W1 Supporting point	kg	396
W2 Supporting point	kg	292
W3 Supporting point	kg	321
W4 Supporting point	kg	416
Operating weight	kg	1425
Shipping weight	kg	1425

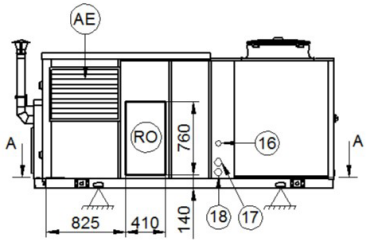
The presence of optional accessories may result in a substantial variation of the weights shown in the table

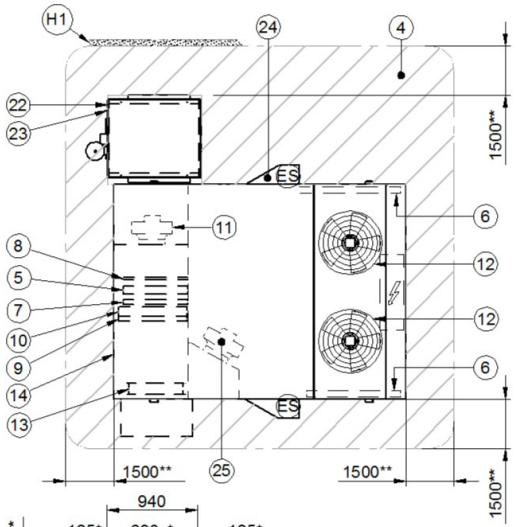
Dimensional drawings

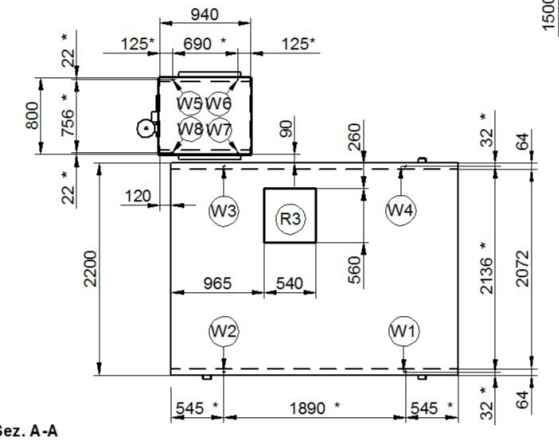
DAA7Z12.2_16.2_CCFFA_GC01X-GC08X_02
Date13/02/2018











Sez. A-A

1. Compressor compartment
2. Electrical panel
3. Condensate drain
4. Functional spaces
5. Internal exchanger
6. External exchanger
7. H2O heating coil / Electric heaters (Otional)
8. Reheat coil (Optional)
9. G4 air filters (Standard)
10. F7 / F9 / electronic filters (optional)
11. Electric fan (Supply)
12. External electric fan
13. Fresh air damper
14. Access for inspection of coils- filters - heating elements
15. Lifting brackets (removable)
16. Humidifier connections
17. H2O heating coil input Ø 3/4"
18. H2O heating coil output Ø 3/4"
19. Outdoor air return cap (optional) accessory separately supplied
20. Power input
21. Gas module (accessory separately supplied)
22. Gas connection UNI ISO 228/1 - G 3/4"
23. Condensate drain (only for condensation gas heating module)
24. Air exhaust caps (accessory separately supplied)
25. Exhaust electric fan

(ES) Air exhaust
(R0) Horizontal return
(R3) Downward air return
(M0)Horizontal air supply
(AE) Fresh air inlet
(H1) Wall with same height as unit on a maximum of three sides
(*) Anti-vibration mount position
(**) Suggested minimum clearance

SIZE		16.2
W1 Supporting point	kg	396
W2 Supporting point	kg	292
W3 Supporting point	kg	321
W4 Supporting point	kg	416
Operating weight	kg	1425
Shipping weight	kg	1425

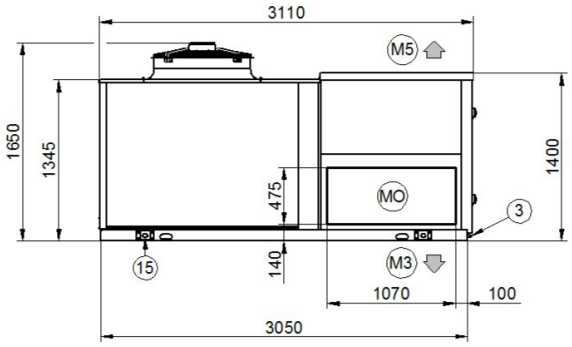
GAS MODULE WEIGHT DISTRIBUTION

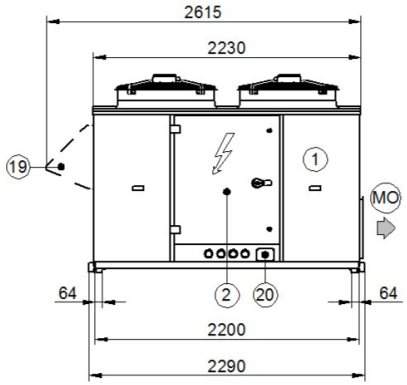
SIZE		16.2
W5 Supporting point	kg	70
W6 Supporting point	kg	58
W7 Supporting point	kg	58
W8 Supporting point	kg	70
Operating weight	kg	256
Shipping weight	kg	256

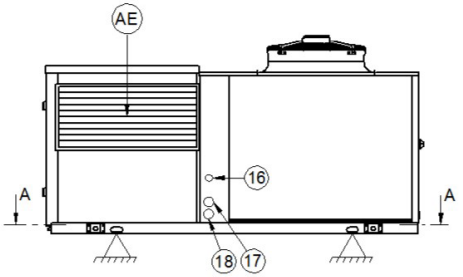
The presence of optional accessories may result in a substantial variation of the weights shown in the table

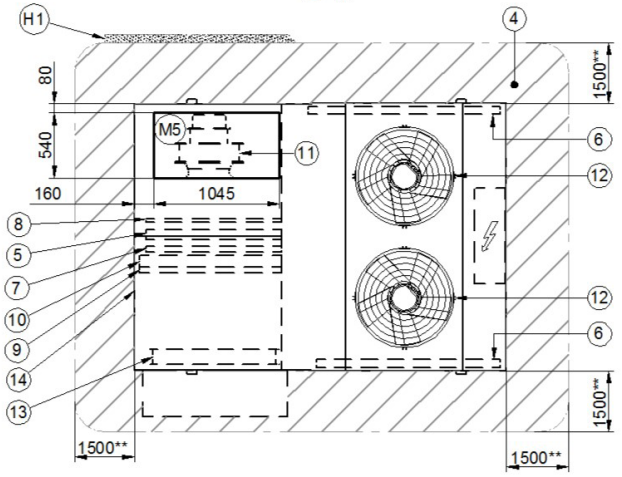
Dimensional drawings

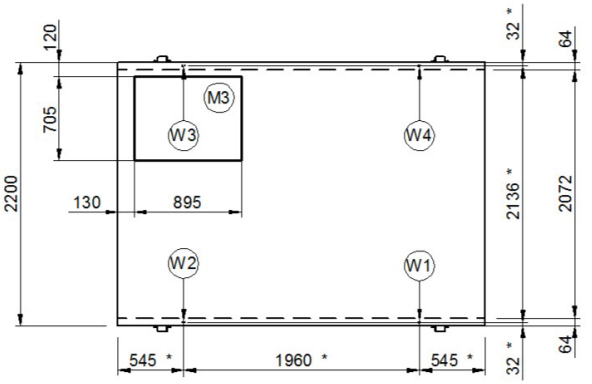
Size 20.4 - 22.4 - 24.4 - CBFFA configuration











Sez. A-A

1. Compressor compartment
2. Electrical panel
3. Condensate drain
4. Functional spaces
5. Internal exchanger
6. External exchanger
7. H2O heating coil / Electric heaters (Otional)
8. Reheat coil (Optional)
9. G4 air filters (Standard)
10. F7 / F9 / electronic filters (optional)
11. Electric fan (Supply)
12. External electric fan
13. Fresh air damper
14. Access for inspection of coils- filters - heating elements
15. Lifting brackets (removable)
16. Humidifier connections
17. H2O heating coil input Ø 1 1/4"
18. H2O heating coil output Ø 1 1/4"
19. Outdoor air return cap (optional) accessory separately supplied
20. Power input

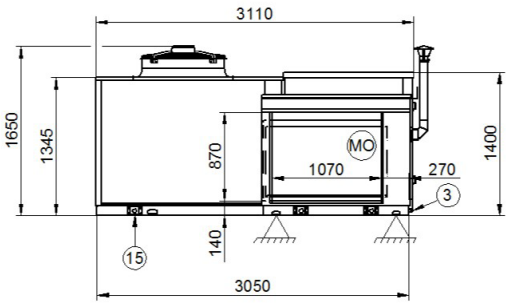
(M0) Horizontal air supply
(M3) Downward air supply (Optional)
(M5) Upflow air supply (Optional)
(AE) Fresh air inlet
(H1) Wall with same height as unit on a maximum of three sides
(*) Anti-vibration mount position
(**) Suggested minimum clearance

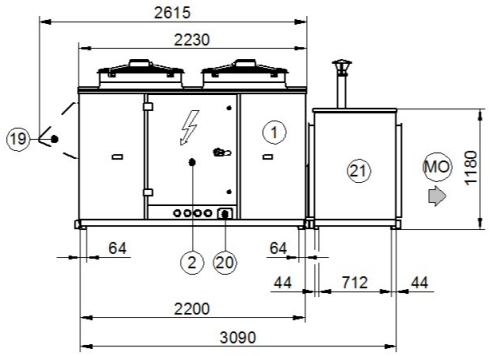
SIZE		20.4	22.4	24.4
W1 Supporting point	kg	390	400	420
W2 Supporting point	kg	266	268	270
W3 Supporting point	kg	298	300	302
W4 Supporting point	kg	404	425	435
Operating weight	kg	1358	1393	1427
Shipping weight	kg	1358	1393	1427

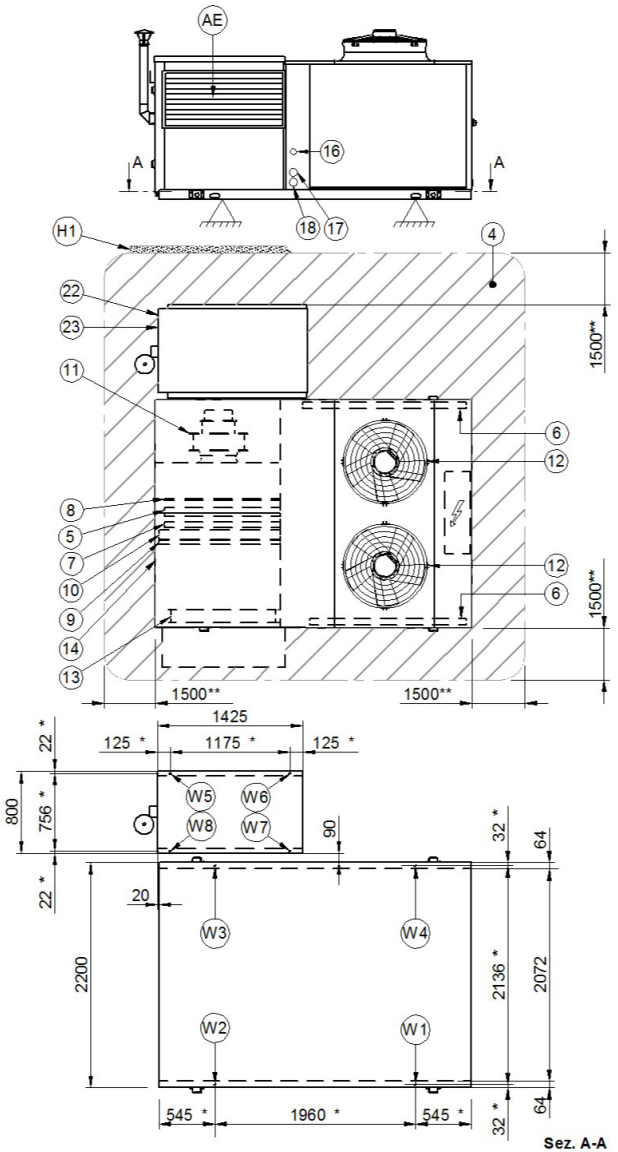
The presence of optional accessories may result in a substantial variation of the weights shown in the table

Dimensional drawings

DAA7Z20.4_24.2_CBFFA_GC08X-GC10X_01
Date13/02/2018







1. Compressor compartment
2. Electrical panel
3. Condensate drain
4. Functional spaces
5. Internal exchanger
6. External exchanger
7. H2O heating coil / Electric heaters (Otional)
8. Reheat coil (Optional)
9. G4 air filters (Standard)
10. F7 / F9 / electronic filters (optional)
11. Electric fan (Supply)
12. External electric fan
13. Fresh air damper
14. Access for inspection of coils- filters - heating elements
15. Lifting brackets (removable)
16. Humidifier connections
17. H2O heating coil input Ø 1 1/4"
18. H2O heating coil output Ø 1 1/4"
19. Outdoor air return cap (optional) accessory separately supplied
20. Power input
21. Gas module (accessory separately supplied)
22. Gas connection UNI ISO 228/1 - G 3/4"
23. Condensate drain (only for condensation gas heating module)

(M0) Horizontal air supply
(AE) Fresh air inlet
(H1) Wall with same height as unit on a maximum of three sides
(*) Anti-vibration mount position
(**) Suggested minimum clearance

SIZE		20.4	22.4	24.4
W1 Supporting point	kg	390	400	420
W2 Supporting point	kg	266	268	270
W3 Supporting point	kg	298	300	302
W4 Supporting point	kg	404	425	435
Operating weight	kg	1358	1393	1427
Shipping weight	kg	1358	1393	1427

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

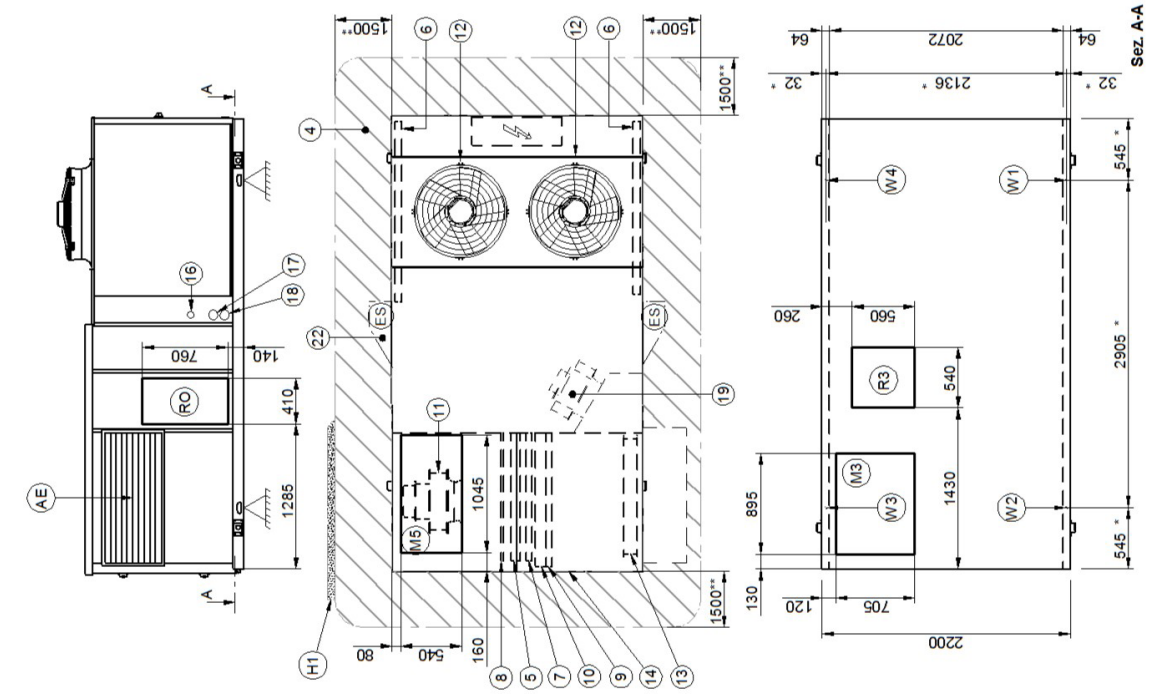
GAS MODULE WEIGHT DISTRIBUTION

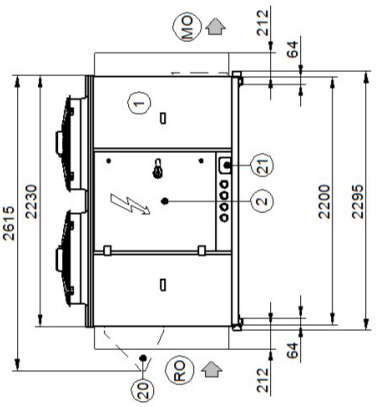
SIZE		20.4 - 22.4 - 24.4
W5 Supporting point	kg	70
W6 Supporting point	kg	58
W7 Supporting point	kg	58
W8 Supporting point	kg	70
Operating weight	kg	256
Shipping weight	kg	256

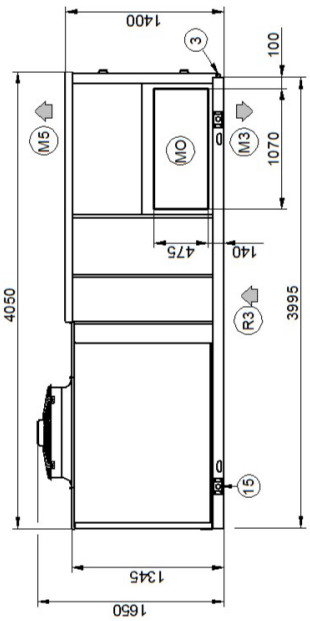
Dimensional drawings

Size 20.4 - 22.4 - 24.4 - CCFFA configuration

DAA7Z20.4_22.2_CCCFA_02
Date13/02/2018







1. Compressor compartment
2. Electrical panel
3. Condensate drain
4. Functional spaces
5. Internal exchanger
6. External exchanger
7. H2O heating coil / Electric heaters (Otional)
8. Reheat coil (Optional)
9. G4 air filters (Standard)
10. F7 / F9 / electronic filters (optional)
11. Electric fan (Supply)
12. External electric fan
13. Fresh air damper
14. Access for inspection of coils- filters - heating elements
15. Lifting brackets (removable)
16. Humidifier connections
17. H2O heating coil input Ø 1 1/4"
18. H2O heating coil output Ø 1 1/4"
19. Exhaust electric fan
20. Outdoor air return cap (optional) accessory separately supplied
21. Power input
22. Air exhaust caps (accessory separately supplied)

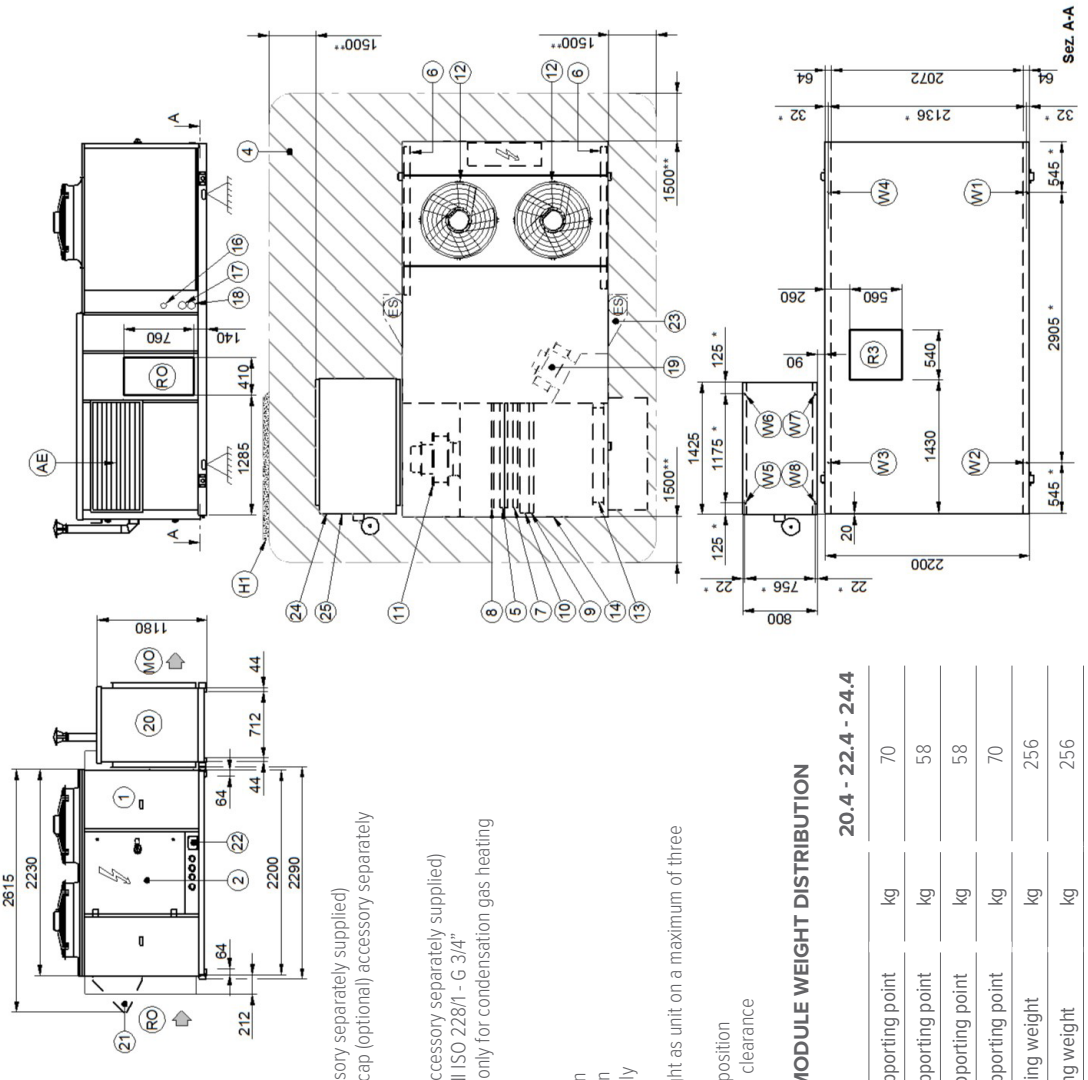
(ES) Air exhaust
(R0) Horizontal air return
(R3) Downward air return
(M0) Horizontal air supply
(M3) Downward air supply (Optional)
(M5) Upflow air supply (Optional)
(AE) Fresh air inlet
(H1) Wall with same height as unit on a maximum of three sides
(*) Anti-vibration mount position
(**) Suggested minimum clearance

SIZE		20.4	22.4	24.4
W1 Supporting point	kg	445	455	475
W2 Supporting point	kg	308	310	312
W3 Supporting point	kg	346	348	350
W4 Supporting point	kg	461	482	492
Operating weight	kg	1560	1595	1629
Shipping weight	kg	1560	1595	1629

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

Size 20.4 - 22.4 - 24.4 Combustion module - CCFFA configuration

DAA7Z20.4_24.2_CBFFA_GC08X-GC10X_02
Date13/02/2018



1. Compressor compartment
2. Electrical panel
3. Condensate drain
4. Functional spaces
5. Internal exchanger
6. External exchanger
7. H2O heating coil / Electric heaters (Otional)
8. Reheat coil (Optional)
9. G4 air filters (Standard)
10. F7 / F9 / electronic filters (optional)
11. Electric fan (Supply)
12. External electric fan
13. Fresh air damper
14. Access for inspection of coils- filters - heating elements
15. Lifting brackets (removable)
16. Humidifier connections
17. H2O heating coil input Ø 1"1/4"
18. H2O heating coil output Ø 1"1/4"
19. Exhaust electric fan
20. Gas module (accessory separately supplied)
21. Outdoor air return cap (optional) accessory separately supplied
22. Power input
23. Air exhaust caps (accessory separately supplied)
24. Gas connection UNI ISO 228/1 - G 3/4"
25. Condensate drain (only for condensation gas heating module)

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

GAS MODULE WEIGHT DISTRIBUTION

SIZE		20.4	22.4	24.4
W1 Supporting point	kg	445	455	475
W2 Supporting point	kg	308	310	312
W3 Supporting point	kg	346	348	350
W4 Supporting point	kg	461	482	492
Operating weight	kg	1560	1595	1629
Shipping weight	kg	1560	1595	1629

SIZE		20.4 - 22.4 - 24.4
W5 Supporting point	kg	70
W6 Supporting point	kg	58
W7 Supporting point	kg	58
W8 Supporting point	kg	70
Operating weight	kg	256
Shipping weight	kg	256

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

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