SMARTPACK3

CKN-iM 10.1÷14.1 RANGE

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



TECHNICAL BULLETIN

SIZE	10.1	14.1
Cooling capacity [kW]	25,3	42,4
Heating capacity [kW]	26,0	45,8

R-454C

ErP 2021 COMPLIANT

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Features

SMARTPACK3 for medium attendance applications

CKN-iM units are high-efficiency stand-alone air conditioners designed to cool small to medium-sized commercial spaces. They are particularly suited to venues with moderate footfall, such as: individual shops, outlet villages, showrooms and modern service stations.
The series uses full inverter technology, meaning that compressors and ventilators can modulate their speed continuously to adapt to the actual demands of the environment served.
This solution makes it possible to follow the trend of the thermal load even in mid-seasons, reaching very high seasonal performance as required by the ErP 2021 regulations.

The system is included into a single unit

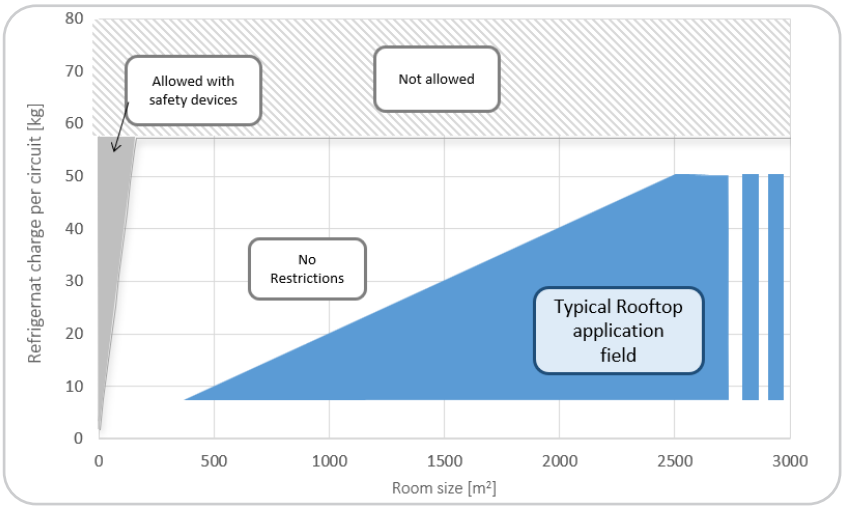
Thanks to the single-block design of the unit, all of the plant engineering parts are contained inside the unit, already assembled and tested.
Three configurations available, from the full recirculation version, with minimum fresh air, to versions with renewal and energy recovery on the exhaust air. Each one can be integrated with a broad range of accessories that customise the product according to the application.

- Single refrigeration circuit with inverter-controlled compressor, for continuous capacity partialization following the thermal load of the building.
- Radial fans directly coupled to EC brushless motors (plug fans) allow to adjust the airflow acording to the characteristics of the aeraulic system. On both the supply and the exhaust section.
- External axial fan directly coupled to DC motor with speed control to optimise condensation.
- Filtration of air in several stages, from coarse particles (ISO Coarse 60% - G4 filters) to classes of absolute filtration.
- Innovative and patented REVO thermodynamic recovery.
- Constant or variable control of the flow of supply air.
- Automatic and variable control of the amount of fresh air based on the actual occupants requirement, with air quality probe.
- Freecooling function when it is possible to use outdoor air directly to meet the internal loads.
- Summer dehumidification function with hot-gas post-heating to increase comfort even with high latent loads.
- Heating solutions that can be used together with or instead of the heat pump: electric heaters, hot water coil, modulating gas module with condensation technology.
- Humidification systems integrated in the unit.
- Possibility of connection to the main supervision systems wtih Modbus communication protocol.

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

Features

Clivet's choice towards a green evolution



Limit straight line calculated with room height of 6 m.

New R-454C refrigerant

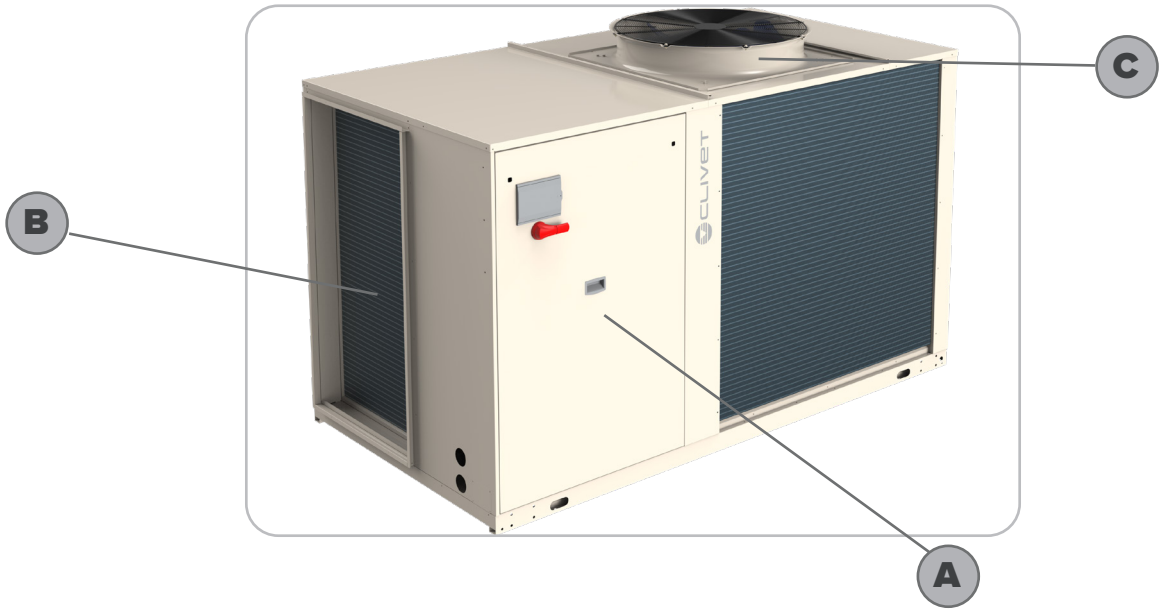
European regulation EC 517/2014 envisages a reduction in the use of HFC (F-gas) refrigerants with the aim of reducing their environmental impact, measured through the GWP (Global Warming Potential) parameter.

Clivet, which has always placed a strong focus on the development of technological solutions aimed at protecting the environment, introduces R-454C refrigerant with a low GWP (148) on Rooftop units as well.

The environmental impact is thereby reduced by up to 95% not only thanks to the low GWP of R-454C, but also thanks to the reduction and optimisation of the refrigerant charge ensured through the careful design of each individual component.

The use of this A2L refrigerant (mildly flammable) is in line with the EN 378 standard, which defines its correct application based on the refrigerant charge and the surface of the rooms serviced.

Full inverter Technology



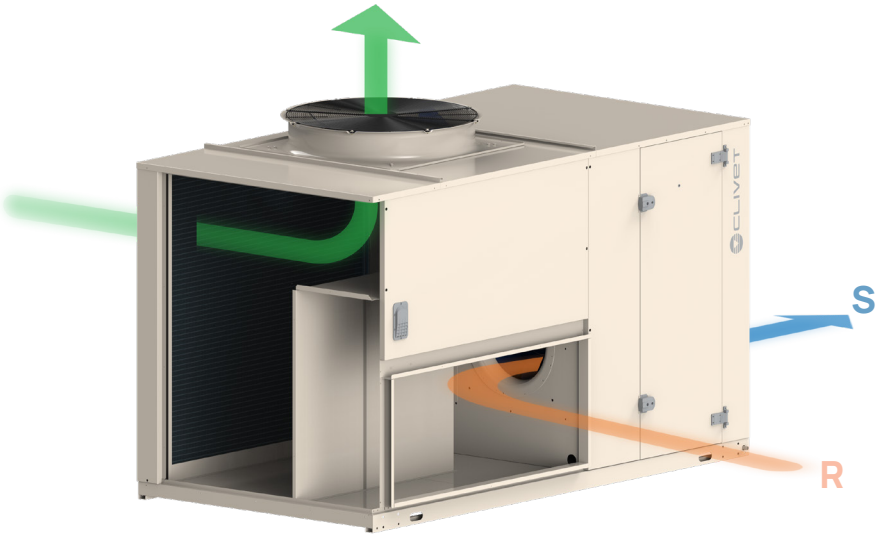
The efficiency of energy-related products (ErP) is one of the pillars of the European programme for a sustainable economy, with the environment and people's quality of life in mind.

The high performance of the CKN-iM series helps achieve this goal through seasonal efficiency values up to 20% higher than the performance limits set by European regulations.

These important results are obtained thanks to the Full Inverter technology applied to the main components of the unit:

A. Cooling circuit with inverter-controlled compressors
B. Plug-fans with brushless motor on the handling side with soft start mode for applications with textile ducts
C. Axial fans with brushless motor on the source side

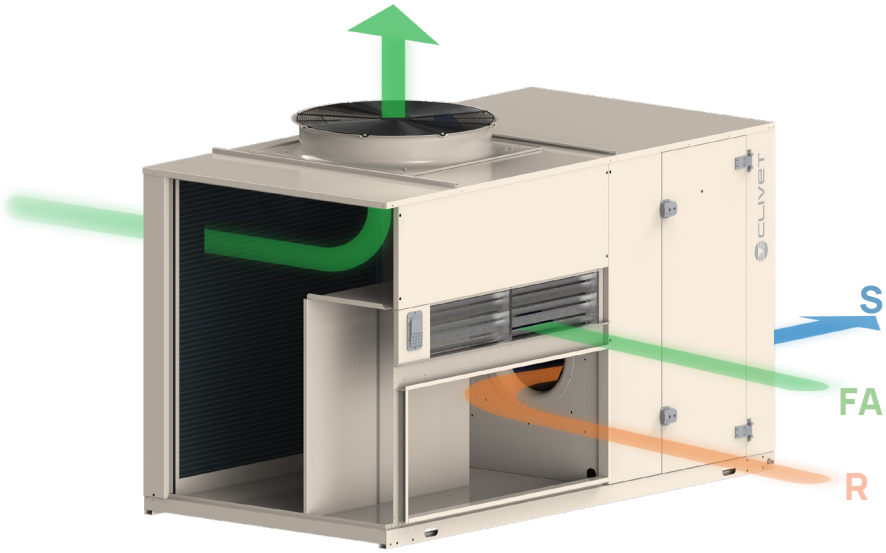
Features



R - Return air
S - Supply air

CAK - Single fan section for full recirculation

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

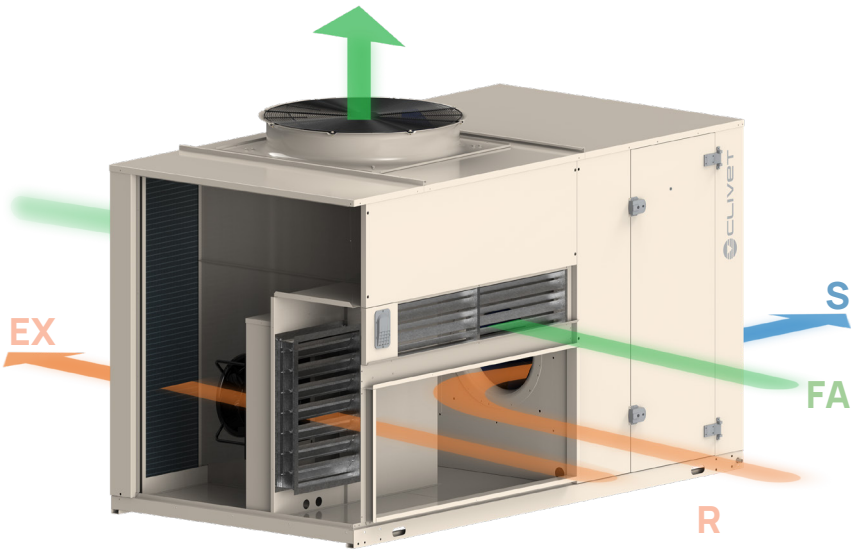


R - Return air
S - Supply air
FA - Fresh air

CBK - Single fan section for recirculation and fresh air

For applications where there is the need to keep the room in over-pressure, with the option of controlling a particular fresh air flow.

As for the CAK configuration, the supply fan section provides the supply and return available static pressure



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

CCK-REVO - Dual ventilating section with renewal air and REVO thermodynamic recovery

A new concept of thermodynamic recovery is introduced, which combines in a single version the benefits and performance of the previous CCK and CCKP configurations.

For applications with automatic air renewal and FREE-COOLING function control. The unit is fitted with an exhaust section featuring an innovative and patented REVO thermodynamic recovery for exhaust air (Recovery EVOlution).

The innovative REVO recovery is always included in the CCK-REVO configuration and uses the technology of the refrigeration circuit with direct expansion.

The energy contained in the flow of exhaust air is recovered in a dedicated sector of the direct expansion source coil. The amount of energy recovered can be easily measured, as in the case of static heat recovery.

Here below are the main benefits of energy recovery:

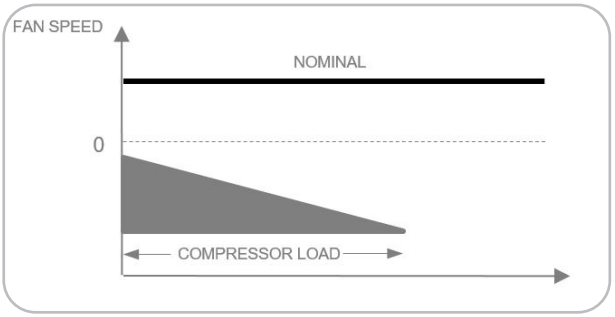
- Increased power delivered to the conditioned room.
- Increased overall efficiency of the unit for significant energy savings and guaranteed investment payback.
- Optimised industrialisation and reliability thanks to the removal of the additional recovery exchanger and consequent refrigerant circuit simplification.
- Elimination of higher electrical consumption for the ventilation of passive recovery devices, thereby reducing the total energy absorbed.
- In winter mode with heat pump operation, it reduces the formation of ice on the exchanger and therefore the defrosting frequency. The operation continuity and overall efficiency of the system are enhanced.
- Also effective for cooling operations, especially in continental and temperate climates where the output of traditional passive recovery devices is essentially negligible due to a low temperature and enthalpy difference between the outdoor and indoor environment.

Features

Automatic management of the air flow

Standard mode

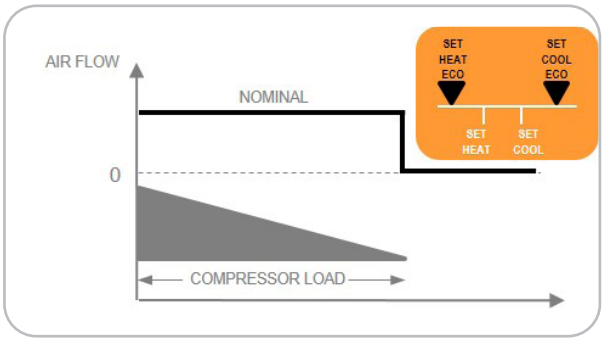
The supply airflow is managed with 0-10V signal.
The signal remains constant and keeps the fan speed consistent in all thermal load conditions and operating mode.



ECO mode (standard function)

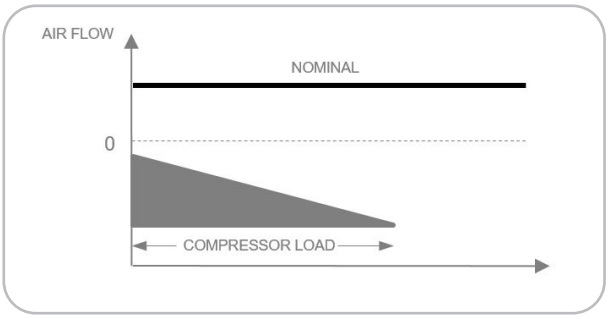
The air flow supply remains constant at varied heat loads and is shutdown when the load is fulfilled.
To further increase the energy savings in this condition, it is also possible to set less demanding operation setpoints for the unit in respect to the standard mode.
This function is indicated to thermally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

- manually
- automatically by means of the Clivet supervision System



Constant air flow (PCOSM option)

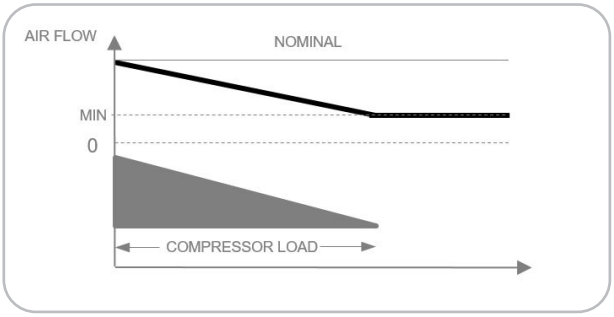
Supply airflow rate remains constant even with the progressive fouling of the filters compensating for the increased pressure drops.



Variable airflow (PVAR option)

The air flow supply varies depending on the heat load, up to a minimum value compatible with the distribution system and the chosen air diffusion.
The ventilation remains active even when the load is fulfilled.
This option allows a important energy savings

- The movement of the air is always active during the operation of the rooftop unit.
- It determines an annual energy consumption comparable or even greater than the compressors.
- The reduction of 20% of the flow generates a saving of 50% on energy absorbed by the ventilators.
- With a reduction of the flow equal to 40%, the saving for ventilation exceeds 70%.
- The variable airflow can therefore lead to a saving of 30% on the overall electrical consumption of the unit.



Moreover, the flow rate of the unit can be controlled as follows:

- PVARDP - Variable airflow with pressure probe on the unit
- PVMV - 4-20 mA signal for the supply airflow modulation
- BMS supervision system (not available with Standard mode management of the air flow)

Smart management of defrosts

The automatic defrosting cycles on surfaces of the external exchanger are managed by SMARTPACK3 in a predictive manner, which reduces both the frequency and the duration. The on-board electronic regulation analyses not only the external conditions but also the changes of the evaporating temperature in the exchanger.
The standard defrosting cycle management involves the stop of the ventilation. This reduces the time required for defrosting and prevents the introduction of too cold air in the served area, maintaining comfortable conditions for the users.
To facilitate the drainage of the condensate water and reduce the defrost time, the aluminum fins of the external exchanger are realized with a special hydrophilic coating.





Room-cleaning function

It may be necessary to carry out a quick clean of the air in the area being served if there is a high and variable level of crowding in it.
A command can be imparted from the HMI or BMS to activate the room ventilation function, which maximises the supply of outdoor air and rapidly reduces the concentration of pollutants indoors.

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%
2nd stage of filtration (optional)	F7	ISO 16890 ePM1 55%
2nd stage of filtration (optional)	F9	ISO 16890 ePM1 80%

Features

Performance according to EN 17625

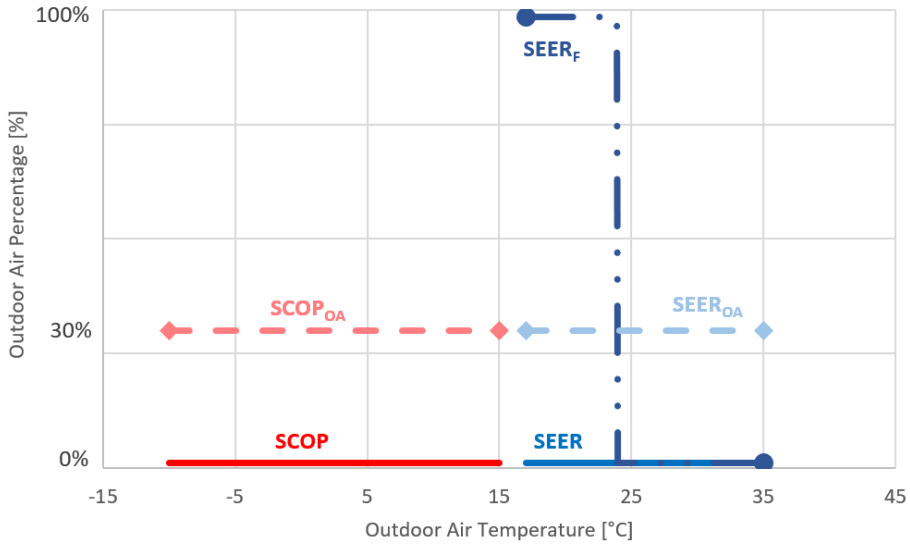
In November 2025, the European standard EN 17625 was published with the aim of defining performance criteria and test methods for rooftop units.
To date, the performance of these units has been assessed on the basis of seasonal parameters such as SEER and SCOP, as defined in standard EN 14825.
However, the introduction of specific legislation was necessary in order to capitalise on certain characteristics typical of rooftop units, such as the calculation of a fresh air supply rate, the ability to operate in free-cooling mode, and the ability to recover energy from the exhaust air that is expelled.
Therefore, in addition to the traditional parameters (SEER, SCOP), the following parameters have been introduced: $SEER_F$, $SEER_{OA}$, $SCOP_{OA}$. All these parameters are always accompanied by their respective n_s.
The performance calculation methods remain unchanged compared to current values in accordance with EN 14825.
The main difference lies in accounting for a fresh air fraction in the performance calculation, using different methods depending on the seasonal parameter.

$SEER_F$

It introduces the concept of free cooling, and therefore T_{free}, defined as the temperature below which the entire thermal load of the building is satisfied by introducing an appropriate amount of fresh air, keeping the heating and cooling resources switched off.

$SEER_{OA}$ / $SCOP_{OA}$

In this mode, the potential presence of a dedicated solution for recovering energy from the exhaust air is also taken into account. The outdoor air percentage therefore remains set to a value of 30% throughout the simulated operating range, both in heating and cooling.



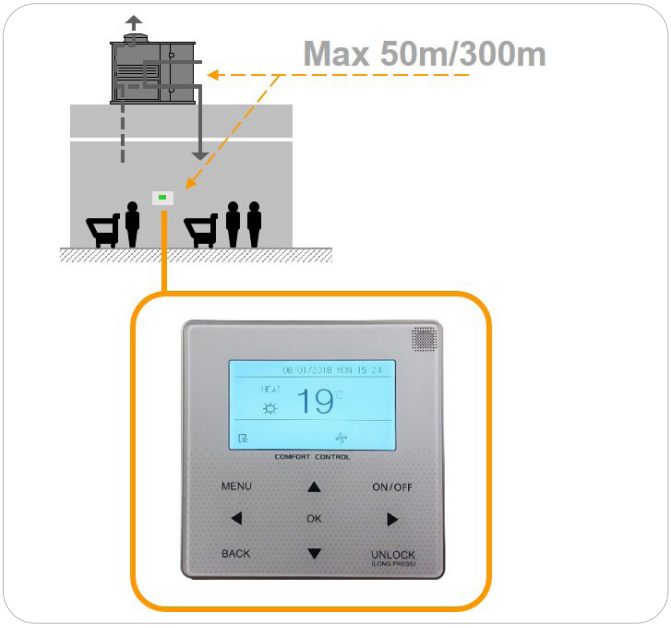
Configured for intelligent resource management and for user comfort

Advanced standard electronic control

SMARTPACK3 is also equipped with everything that is required for the automatic control of ambient temperature and humidity and, through their comparison with the outdoor air conditions:

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

Connection to the user interface through shielded cable 3 x 0.75 mm^2 for the communication, clable of 2 x 1 mm2 for power supply



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

Some of its main functions:

- daily/weekly programming when the unit is to come on and go off;
- il manually changing the operating mode (hot or cold) and/or the set-point.
- control of the washing function;
- viewing alarms and the unit status;
- managing the operating parameters
- temperature measuring through in-built probe

Communication with supervisory systems

SMARTPACK3 can easily be integrated into supervisory systems that use Modbus as a communication protocol. The serial connection is present on the built-in electronic board and is a unit standard. It allows the access to the complete list of operating variables, controls and alarms.

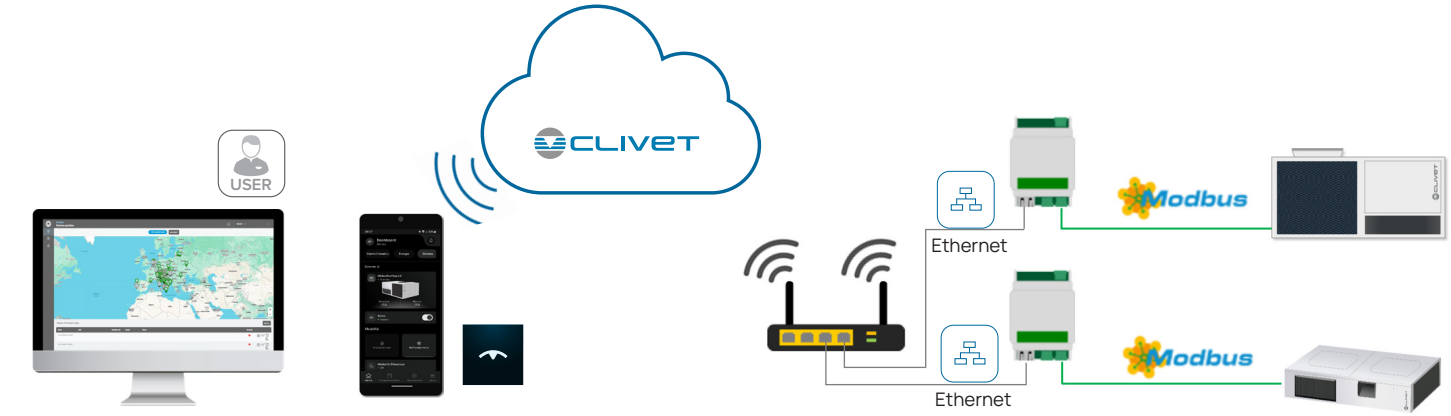
Device for ambient pressure adjustment

The ambient pressure control device, which compares the intake air pressure with the external air pressure, detects if the pressure is too high, too low or if it is balanced whether the served room is in over-pression or under-pression conditions.
During the fresh air phase, operating on the fresh air damper, the unit can compensate the pressures and keep the ambient at the desired pressure.
The pressure is regulated basing on the unit settings defined at the start-up.
(CCK-REVO configuration).

Features

Advanced unit management: CLIVET EYE

CLIVET EYE is Clivet's specialized solution for cloud-based supervision of individual units.
By providing the "IOTI - IoT industrial module for cloud based interoperability & services option, it is possible to access the main machine parameters through the CLIVET EYE application and the dedicated web page.



Interface available from
www.cliveteye.com

App **CLIVET EYE**
Google Play and Apple store

Through the IoT module, it is possible to perform remote monitoring and management of the main unit parameters with a User license and unlimited expiration.
Among the main functions for all monitored units, the User license allows to:

- View the main operating parameters (1)
- Turn the unit on and off
- View anomalies and alarm history (no reset)
- Create graphs with the trend of the main system variables (2)
- Program a weekly schedule on an hourly basis (3)
- Consult power consumption if a dedicated option is provided
- View the geographical map of the supervised units



⚠ IoT module to be provided for each unit to be remotely monitored.
⚠ Internet ethernet connection in charge of customer.
⚠ Installation is a responsibility of the Customer.
⚠ Maximum unit distance – IOTI: 1000m; IOTI - router: 100m;

Refer to the specific Technical Bulletin for more information.

Advanced system management: INTELLIAIR

IINTELLIAIR is Clivet's specialised solution for the supervision and control of air conditioning systems in all applications where comfort and energy efficiency are paramount. Thanks to the integration with independent Rooftop units and ventilation units, consumption is minimised and the utmost comfort of the served rooms is ensured.

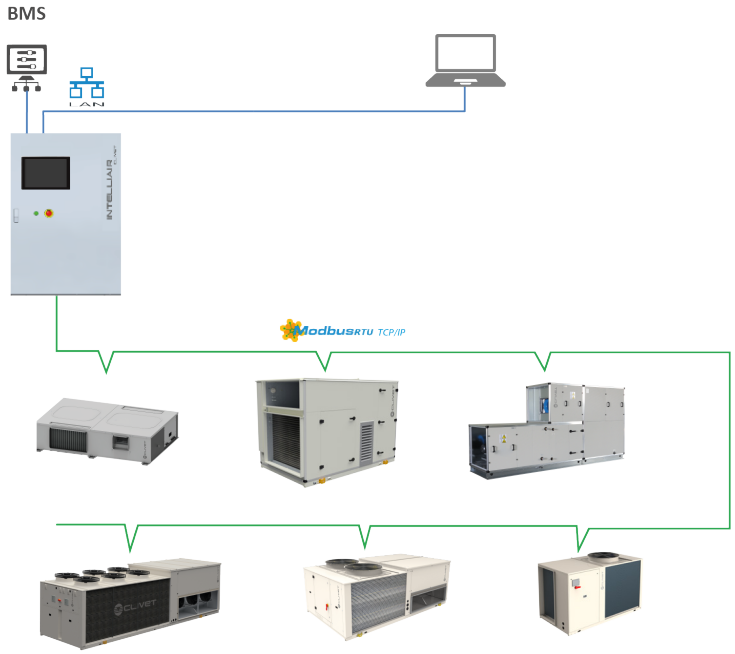
Communication between INTELLIAIR, Clivet air conditioning units and field devices is via RS-485 serial line with Modbus RTU communication protocol or with Ethernet cable for units communicating in Modbus TCP/IP.

Some of its main functions are:

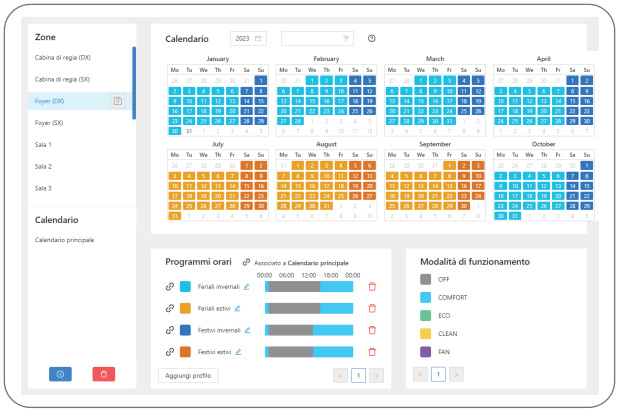
- General control of the building and individual areas via schematic system diagram
- Display of units' operating mode as well as alarms and maintenance status
- Modification of area operating parameters such as room temperature setpoint, relative humidity and air quality
- Display of room variable trends 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.







Standard unit technical specifications

Compressor

10.1 – 14.1

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

Structure

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

Panelling

Panels of the compressor panel in steel sheet metal, painted using polyester powders, colour RAL 9001 and covered on the inside with ashlared sound-absorbent material.
Sandwich panels in the air treatment section with dual walls in steel sheet metal with polyurethane insulation (40 kg/m^3), thickness of outer sheet metal 6/10 mm galvanized and painted using polyester powders colour RAL 9001, polyurethane thickness 30 mm with thermal conductivity coefficient 0.022W/mK, thickness of internal sheet metal 5/10 mm hot galvanized. The panel are provided with a PVC profile for thermal insulation and a EPDM rubber gasket that ensures the hermetic seal. All panelling can easily be removed to allow complete accessibility to internal components.

Internal exchanger

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

External exchanger

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

Fan

Internal section

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

External section

Helical fans with 4 profiled blades made of reinfoced plastic, directly coupled to the brushless motor with electronic control, IP 54 execution. Fans are located in aerodinamically shaped structures to increase efficiency and minimize noise level, equipped with accident prevention steel guards.

Configuration with extraction and exhaust (CCK-REVO)

Exhaust fan

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

Refrigeration circuit

Cooling circuit complete with:
- refrigerant charge (R-454C)
- high pressure switch
- dehydrator filter
- electronic expansion valve
- 4-way reverse cycle valve
- liquid separator
- low pressure safety valve
- liquid receiver

Filtration

Fresh air intake and ambient air return

Folded filter for a larger filtering surface, made of a galvanised sheet metal frame with a galvanised and electro-welded protective mesh and a regenerable filter media made of polyester fibres primed with synthetic resins. G4 efficiency ((ISO 16890 Coarse 60%). Self-extinguishing type (class 1 flame resistance - DIN 53438).

Drain pan

Internal section

Condensate collection tray made of 3105 H24 aluminium alloy with anti-condensation insulation, welded and equipped with siphon drain tube.

Electrical panel

The power section includes:
- main disconnecting switch with door lock and fuse
- phase monitor
- protection fuse for auxiliary circuit
- fan motor circuit breakers of the internal section
- circuit breaker to protect the auxiliary circuit transformer and options

The microprocessor control section includes:
- treated air temperature control
- supply temperature limit probe
- provision for remote probe signal
- serial communication module for MODBUS supervisor
- daily, weekly programmer of temperature set-point and unit on/off
- compressor timing and protection
- self-diagnosis system with immediate display of the failure code
- clean contacts for remote ON-OFF, cumulative alarm, fan status, compressor status, summer/winter mode

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

IoT mode (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.

Test

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

Accesories

CHW2 - Two-rows hot water coil
3WVM - 3-way modulating valve
2WVM - 2-way modulating valve
EH - Electric heaters
HSE - Immersed electrode steam humidifier
PUE - External Humidifier management with 0-10V signal
PGCCH - Anti-hail protection grilles
LTEMP1 - Application for low outdoor temperature
CPHG - Hot gas re-heating coil
RPRC - Compressors vane refrigerant leak detector
FC - Thermal FREE-COOLING
FCE - Enthalpy FREE-COOLING
EXFLOWC - Application in spaces with forced air exhaust at variable flow and exhaust section
SER - Manual outdoor air damper
SERM - Outdoor air motorized on/off damper
SERMD - Modulating motorized outdoor air damper
VENH - High static pressure fan
PVAR - Variable airflow
PCOSM - Constant supply airflow
PVARDP - Variable airflow with pressure probe on the unit
PVMV - 4-20mA signal for supply airflow modulation
PAQC - Air quality probe for CO_2 rate check
PAQCV - Air quality probe for CO_2 and VOC rate check
PAQC2 - Double air quality probe for CO_2 rate check
PAQCV2 – Double air quality probe for CO_2 and VOC rate check
PPAQC – External CO_2 signal management
F7 - F7 high efficiency air filter (ISO 16890 ePM1 55%)
F9 - F9 high efficiency air filter (ISO 16890, ePM1 80%)
PSAF - Differential pressure switch for dirty air filters
CTT - Temperature control with thermostat
CTEM – Ambient temperature control with built-in probes
CSOND - Ambient humidity and temperature control with built-in probes
IOTI – IoT industrial module for cloud based interoperability & services
DESM - Smoke detector
CONTA2 - Energy meter
CHMET - Cooling and Heating capacity meter
DML - Demand limit
PTCO – Set up for shipping via container

Accessories separately supplied

GCX - Condensing gas heating module and modulating control
AMRX – Rubber antivibration mounts
AMRMX – Rubber antivibration mounts for unit and gas module
RPRMX – Remote supply duct refrigerant leak detector
RPRCMX – Remote supply duct refrigerant leak detector and compressors vane refrigerant leak detector
CMSC13X – Serial communication module for Modbus TCP/IP, BACnet IP and BACnet MSTP supervisors
MDMTX - Management of temperature ambient probes
MDMTUX - Management of ambient temperature and humidity probes
MDMADX – Advanced monitoring and management ambient probes

Standard unit technical specifications

Configuration with dual ventilating section with fresh air and REVO thermodynamic recovery (CCK-REVO)

Same technical features as the structural configuration with a single fan section for all recirculation (CAK) and a single fan section for recirculation and fresh air (CBK), plus:

Modulating motorised outdoor air damper for renewal and FREE-COOLING

Exhaust fan

Reverse-blade screwless plug-fan driven by EC brushelss DC motors with direct coupling

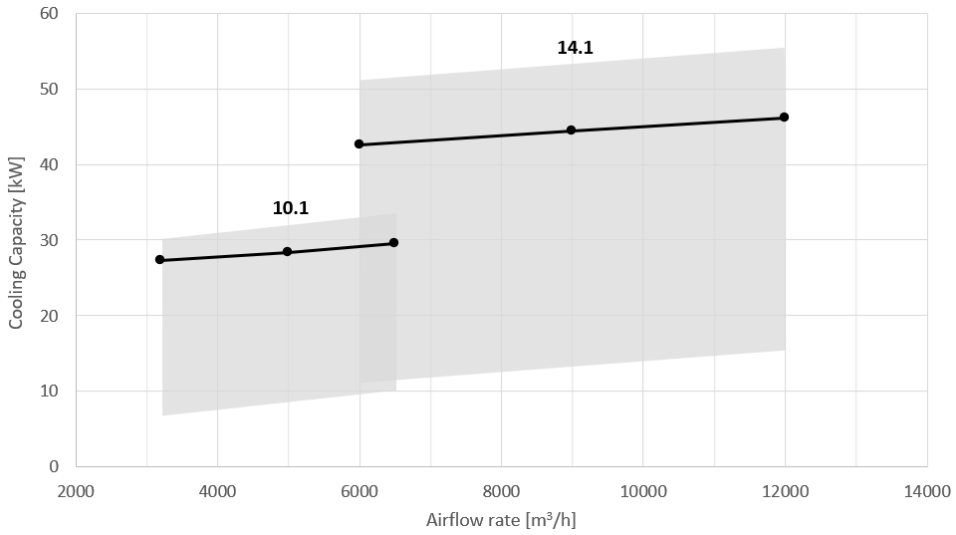
REVO exhaust air thermodynamic energy recovery (CCK-REVO)

The energy contained in exhaust air is recovered on a portion of the external exchanger, through a dedicated ventilating section.
The purpose of the recovery is to improve the thermal level of the refrigerant fluid circulating in the exchanger, by varying in a useful way the temperature at which the condensation or evaporation of the operating fluid is completed. As a result, the favourable air temperature on the source side increases the output and efficiency of the unit.
Clivet has filed a patent on this innovative recovery.

Unit configuration

How to choose the unit

Inverter technology makes it easier to select the unit.
Indeed, the high partialization range of delivered capacity ensures the unit constantly and continuously adapts to the specific heating and cooling requirements of the system.
Moreover, the unit can autonomously deliver higher capacity than the rated one when required. It is thus possible to determine the size of the unit according to the most frequent load situations, with the certainty of being able to meet load peaks for limited periods of time.



Performance in CCK-REVO configuration: summer conditions: room air 27°C D.B./19°C W.B., temperature of air entering the external exchanger 35°C D.B./24°C W.B. and 30% outdoor air

General technical data

Performances - Standard airflow

Size				10.1		14.1	
Operation				**NOM***	**MAX****	**NOM***	**MAX****
Cooling							
Cooling capacity	CAK	1	kW	25,1	34,9	42,0	48,7
Sensible capacity		1	kW	20,7	26,1	32,9	36,5
Compressor power input		1	kW	7,26	19,3	15,7	26,0
EER		1	-	3,46	1,81	2,67	1,87
Cooling capacity	CBK	2	kW	26,2	36,2	43,8	50,6
Sensible capacity		2	kW	21,7	27,1	34,3	37,9
Compressor power input		2	kW	7,34	19,5	15,9	26,2
EER		2	-	3,57	1,86	2,76	1,93
Cooling capacity	CCK-REVO	3	kW	27,7	38,4	46,4	53,7
Sensible capacity		3	kW	22,9	28,5	36,2	39,9
Compressor power input		3	kW	7,12	18,9	15,4	25,5
EER		3	-	3,90	2,03	3,02	2,11
REVO recovery efficiency		4	%	78	81	77	79
Heating							
Heating capacity	CAK	1	kW	26,2	35,7	45,4	70,8
Compressor power input		1	kW	6,00	10,4	9,48	22,3
COP		1	-	4,38	3,43	4,79	3,17
Heating capacity	CBK	2	kW	26,4	35,6	45,8	71,0
Compressor power input		2	kW	5,54	9,63	8,83	20,7
COP		2	-	4,77	3,70	5,19	3,42
Heating capacity	CCK-REVO	3	kW	27,7	37,3	48,0	74,4
Compressor power input		3	kW	5,51	9,57	8,77	20,6
COP		3	-	5,03	3,90	5,48	3,61
REVO recovery efficiency		5	%	83	85	80	82

ll The Product is compliant with the Erp (Energy Related Products) European Directive. It includes the Commission delegated Regulation (EU) No 2016/2281, also known as Ecodesign Lot21.
Contains fluorinated greenhouse gases (GWP 148)
Performances in cooling: Indoor air temp. 27°C D.B./19°C W.B., Entering external exchanger air temperature 35°C D.B./24°C W.B., EER referred only to compressors
Performance in Heating: Indoor air temp. 20°C D.B./12°C W.B., entering air to the external exchanger 7°C D.B./6°C W.B. COP referred only to compressors

1. Full recirculation performance
2. Performance with 30% outdoor air
3. Performance with 30% outdoor air, including energy recovery on exhaust air
4. Energy recovery efficiency determined on exhaust air. Indoor temperature 27°C DB/19°C WB, outdoor temperature 35°C DB/24°C WB
5. Energy recovery efficiency determined on exhaust air. Indoor temperature 20°C DB/12°C WB, outdoor temperature 7°C DB/6°C WB

* NOM = data referring to units in operation with inverter frequency optimised for this application.
** MAX = data referring to units in operation with maximum allowed inverter frequency

Performance in accordance with the ErP Directive

Size			10.1	14.1
Cooling				
Cooling capacity	6	kW	25,3	42,4
EER	6	-	2,96	2,34
SEER	7	-	4,72	4,47
ηsc	7	%	185,8	175,8
Eurovent seasonal efficiency class			A	B
Heating				
Heating capacity	8	kW	26,0	45,8
COP	8	-	3,60	3,84
SCOP	7	-	3,66	3,77
ηsh	7	%	143,4	147,8
Eurovent seasonal efficiency class			A	A

6. Full recirculation capacity according to EN 14511:2022 indoor air temperature 27°C D.B./19°CW.B.; outdoor temperature 35°C. EER in accordance with EN 14511:2022
7. Data calculated in compliance with EN 14825:2022, average climate
8. Full recirculation capacity according to EN 14511:2022 indoor air temperature 20°C; outdoor temperature7°CD.B./6°CW.B. COP in accordance with EN 14511:2022

General technical data

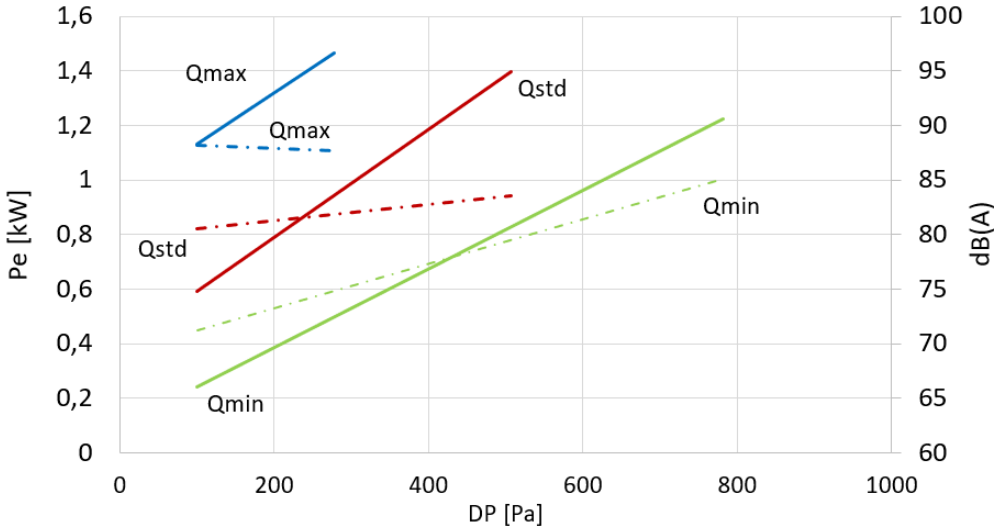
Construction

Size				10.1	14.1
Compressor					
Type of compressors		1	-	SCROLL	SCROLL
N° compressors			Nr	1	1
Refrigeration circuits			Nr	1	1
Control capacity			%	20-100	20-100
Refrigerant charge	CAK/CBK/CCK-REVO	2	kg	5,6	7,0
Air Handling Section Fans (Supply)					
Type of supply fan/motor		3	-	RAD/EC	RAD/EC
Fan diameter			mm	400	500
No. of supply fans			Nr	1	1
Supply airflow			m3/h	5000	9000
Installed unit power			kW	1,5	2,85
Max. static pressure supply fan		4	Pa	510	570
Installed unit power	(VENH opt)		KW	2,85	3,95
Max. static pressure supply fan		4	Pa	710	830
Fans (Exhaust) only configuration CCK-REVO					
Type of fans/motor		3	-	RAD/EC	RAD/EC
Number of fans			Nr	1	1
Installed unit power			kW	1,1	1,5
External Section Fans					
Type of fans/motor		5	-	AX/EC	AX/EC
Fan diameter			mm	750	890
Number of fans			Nr	1	1
Airflow			m3/h	13000	21000
Installed unit power			kW	0,92	1,5
Connections					
Condensate drain			mm	20	20
Power supply					
Standard power supply			V	400/3~/50 +N	400/3~/50+N

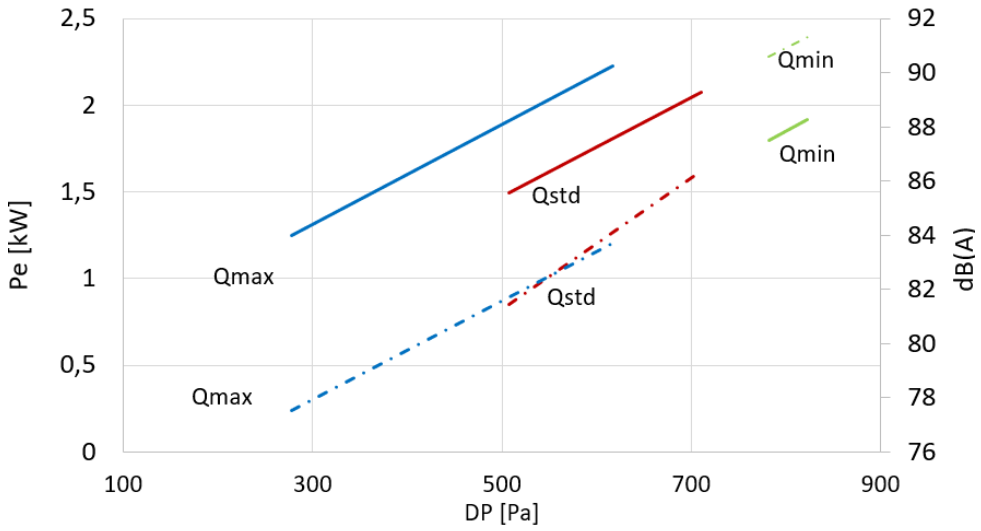
1. SCROLL= Scroll compressor
2. Indicative valueccs for standard units with possible +/-10% variation. The actual data are indicated on the label of the unit
3. RAD = Electronically controlled radial fan - EC = Electronically Commutated
4. Net pressure available to overcome supply and return pressure losses
5. AXIAL = Axial fan - EC = Electronically Commutated

Fan performances

Size 10.1 - Standard



Size 10.1 - High static pressure

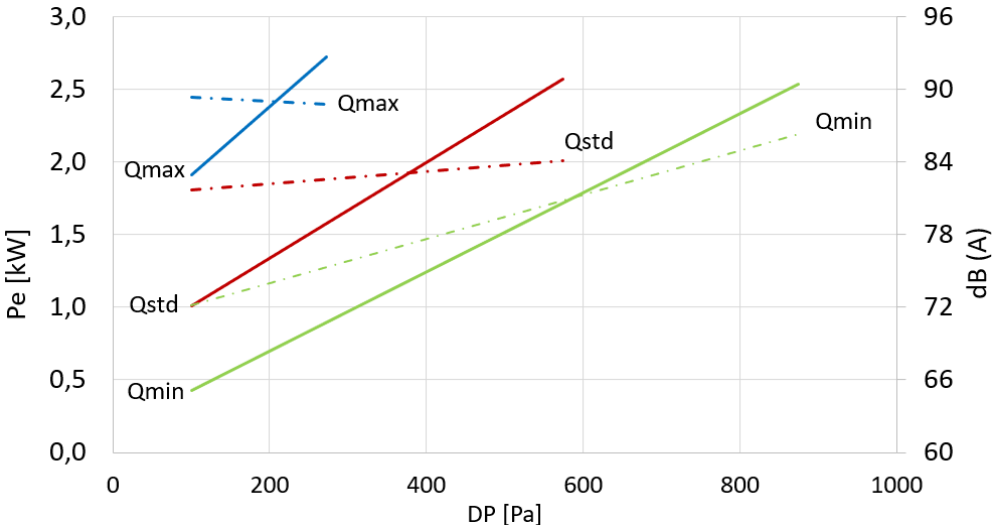


Qe = Extracted air flow rate
= Pe = Total absorbed electrical power
= dB(A) = Sound Power at the supply section

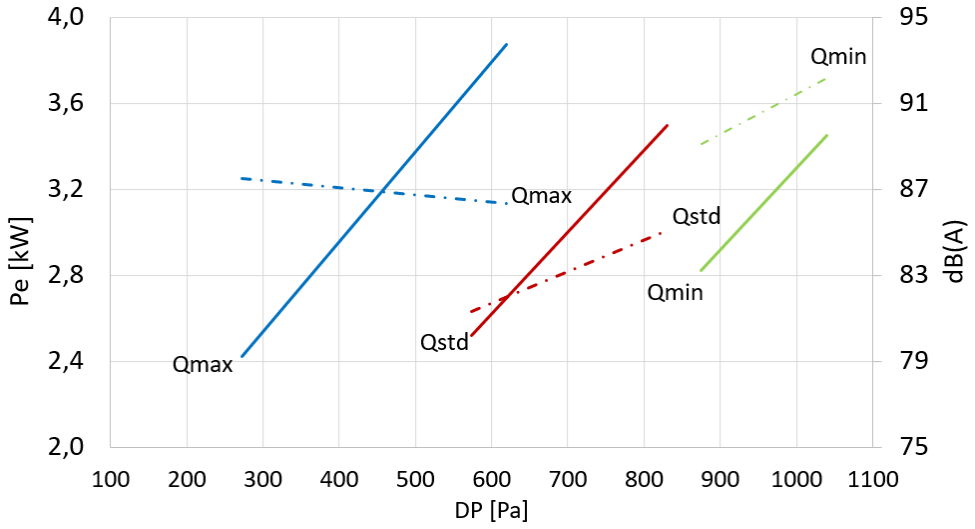
The performance takes into account the internal pressure drops of the std unit in CAK configuration (treatment coil pressure drops, standard filters, etc.).
To determine the required performance of the supply fans, the pressure drops of any accessories must be added to the desired available static pressure.

General technical data

Size 14.1 - Standard



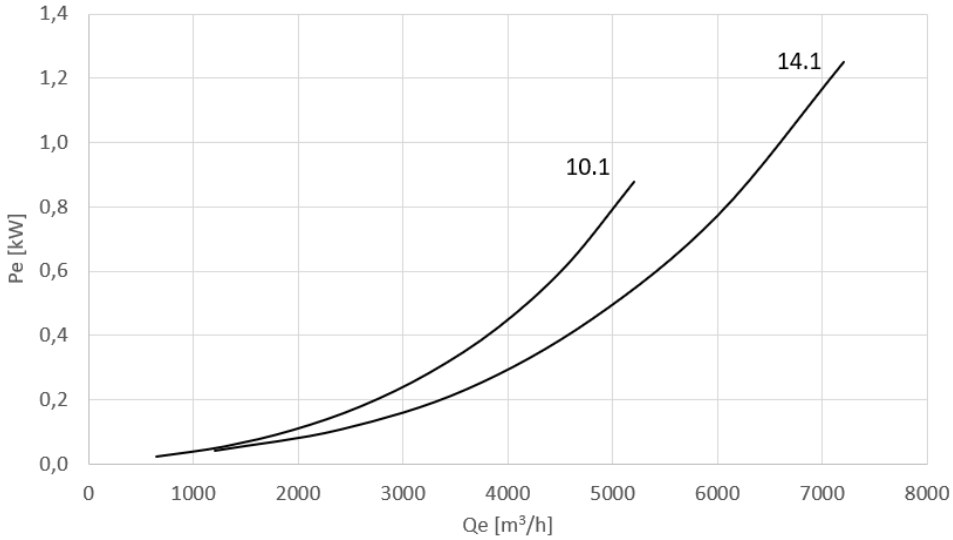
Size 14.1 - High static pressure



Qe = Extracted air flow rate
= Pe = Total absorbed electrical power
= dB(A) = Sound Power at the supply section

The performance takes into account the internal pressure drops of the std unit in CAK configuration (treatment coil pressure drops, standard filters, etc.).
To determine the required performance of the supply fans, the pressure drops of any accessories must be added to the desired available static pressure.

Exhaust fan



Size		10.1	14.1
Qmin	m³/h	3200	6000
Qstd	m³/h	5000	9000
Qmax	m³/h	6500	12000

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			10.1	14.1
CPHG - Hot gas re-heating coil		Pa	21	19
CHW2 - Two-rows hot water coil		Pa	34	31
F7 - F7 high efficiency air filter (ISO 16890 ePM1 55%)	1	Pa	86	83
F9 - F9 high efficiency air filter (ISO 16890 ePM1 80%)	1	Pa	120	117
GCX - Condensig gas heating module with modulating control		Pa	66	62

The values shown are to be considered approximate for units operating power in normal use with standard airflow rate.
1. Pressure drops with filters with average dirtiness

Fan

Size			10.1	14.1
Fan				
Nominal air flow-rate		m³/h	5000	9000
Supply fan consumption	1	W	590	1010
Exhaust fan consumption		W	50	190
SFP (Specific Fan Power)		W/(m³/s)	461	480

1. Available static pressure difference between supply and return: 100 Pa

General technical data

Sound levels - Nominal operation

Size	Sound power level (dB)								Sound Power Level	Sound pressure level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
10.1	96	86	86	78	75	69	62	56	81	64
14.1	98	89	84	82	81	80	69	71	86	68

The sound levels are referred to unit operating at nominal 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)
Measurements are carried out accordingly to UNI EN ISO 9614-1, as required by Eurovent Certification EUROVENT 8/1. It requires a 2 dB(A) tolerance on sound power level, only acoustic value to be certified.
Please note that when the unit is installed in conditions different from nominal test conditions (e.g. near walls or obstacles in general), the sound levels may undergo substantial variations.

Sound levels referred to ESP as per EN 14511:2022

Size		10.1	14.1
Sound power with casing	dB(A)	81	86
Available static pressure	Pa	62	100

Data referred to nominal air flow rate
Data according to EN 12102 "Air conditioners, liquid chilling packages, heat pumps and dehumidifiers with electrically driven compressors, for space heating and cooling — Airborne noise measurement — Determination of the sound power level".

Electrical data

Configuration with full recirculation (CAK) / recirculation and fresh air (CBK)

Size			10.1	14.1
F.L.A. - Full load current at max admissible conditions				
F.L.A. - Total	1	A	35,0	53,6
F.L.I. - Full load power input at max admissible conditions				
F.L.I. - Total	2	kW	21,1	32,6
M.I.C. Maximum inrush current				
M.I.C. - Value		A	35,0	53,6

Structural configuration: recirculation, fresh air and ejection (CCK-REVO)

Size			10.1	14.1
F.L.A. - Full load current at max admissible conditions				
F.L.A. - Total	1	A	37,1	56,5
F.L.I. - Full load power input at max admissible conditions				
F.L.I. - Total	2	kW	22,5	34,5
M.I.C. Maximum inrush current				
M.I.C. - Value		A	37,1	56,6

Data refer to standard units.
Power supply: 400/3~/50+N +/-6%.
Voltage unbalance: max 2 %

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

Pressure drops of optional components

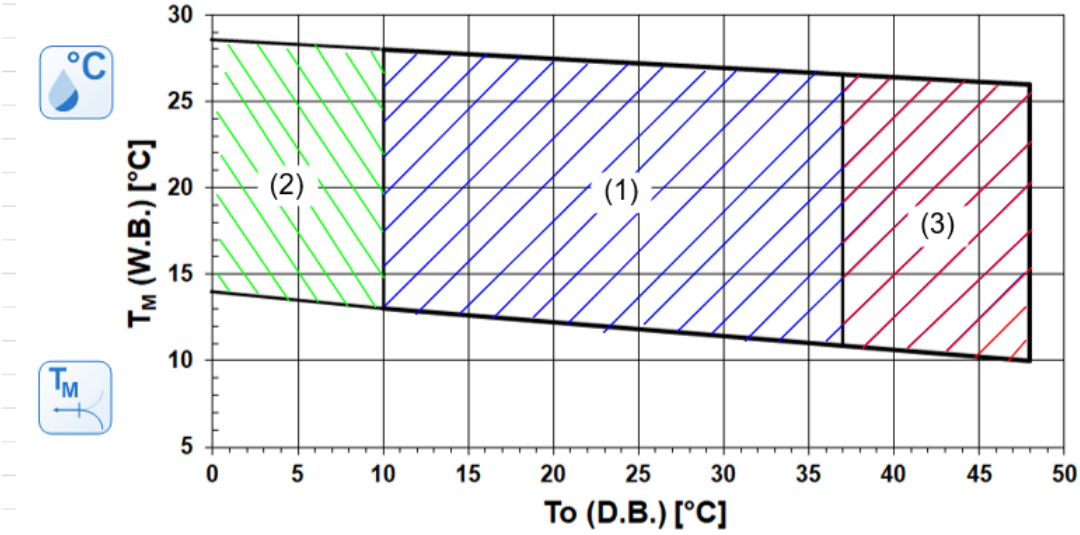
To obtain the electrical input of the unit including accessories, add the standard data in Electrical Data table to those for the selected accessories.

SIZE			10.1	14.1
F.L.A. Absorbed current				
F.L.A. EH10 - 6 kW electric elements		A	8,7	-
F.L.A. EH12 - 9 kW electric elements		A	13	-
F.L.A. EH15 - 13,5 kW electric elements		A	19,5	19,5
F.L.A. EH17 - 18 kW electric elements		A	-	26
F.L.A. EH20 - 24 kW electric elements		A	-	34
F.L.A. HSE3 - Immersed electrodes steam humidifier of 3 kg/h		A	3,2	3,2
F.L.A. HSE5 - Immersed electrodes steam humidifier of 5 kg/h		A	-	5,4
F.L.A. HSE8 - Immersed electrodes steam humidifier of 8 kg/h		A	-	8,7
F.L.A. VENH - High static pressure fan	1	A	2,4	2,0
F.L.I. Power input				
F.L.I. EH10 - 6 kW electric elements		kW	6	-
F.L.I. EH12 - 9 kW electric elements		kW	9	-
F.L.I. EH15 - 13,5 kW electric elements		kW	13,5	13,5
F.L.I. EH17 - 18 kW electric elements		kW	-	18
F.L.I. EH20 - 24 kW electric elements		kW	-	24
F.L.I. HSE3 - Immersed electrodes steam humidifier of 3 kg/h		kW	2,3	2,3
F.L.I. HSE5 - Immersed electrodes steam humidifier of 5 kg/h		kW	-	3,8
F.L.I. HSE8 - Immersed electrodes steam humidifier of 8 kg/h		kW	-	6
F.L.I. VENH - High static pressure fan	1	kW	1,6	1,3

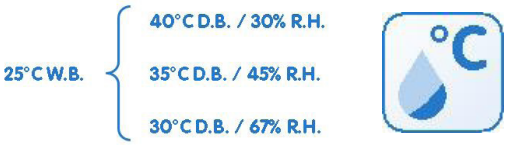
1. The absorption value that needs to be added on takes into account the difference between the optional high head fans and the standard fans.

General technical data

Operating range (Cooling)



WET BULB TEMPERATURE - EXAMPLE



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

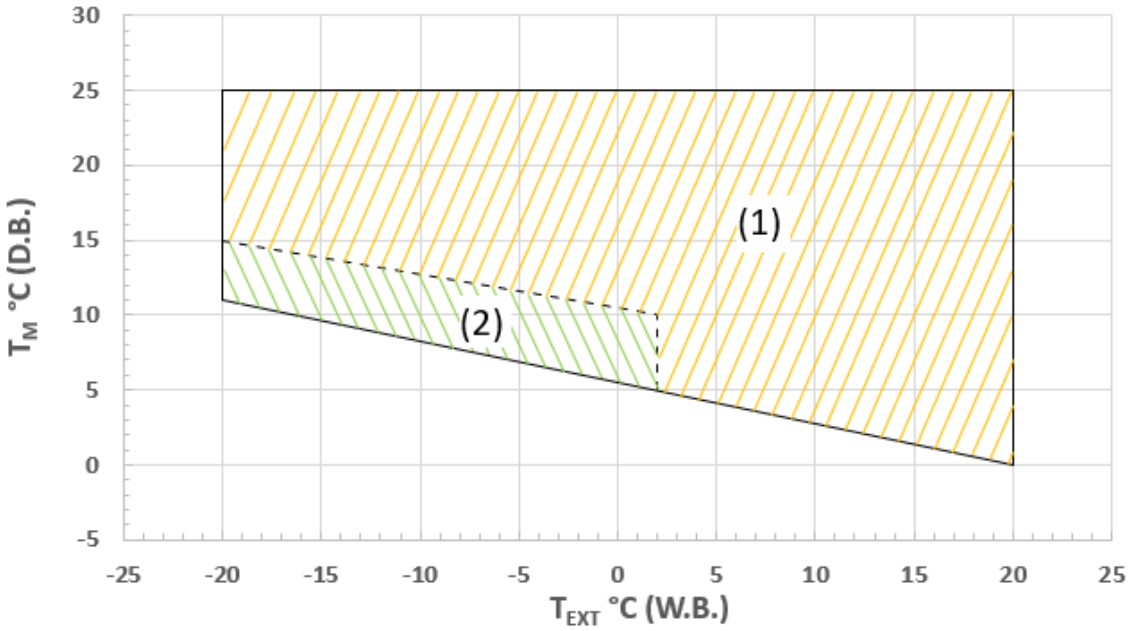
To verify the operation field of the operating units with percentages of outdoor air, always calculate the Tm mixing temperature at the internal heat exchanger input.

Tm = Inlet air temperature in the internal exchanger
wet bulb temperature (W.B.= WET BULB)

Text = External exchanger inlet air temperature
measured temperature with wet bulb (D.B.= DRY BULB)

Within its operating range, the unit can work at a partialized load to maximise energy efficiency
1. Standard unit operating range
2. Operating range of the unit in FREE-COOLING mode (CCK-REVO version)
3. Operating range with capacity modulation

Operating range (Heating)



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

To test the operation range of the operating units with percentages of outdoor air, always calculate the Tm temperature of the mix at the inlet of the internal heat exchanger.

Tm = Inlet air temperature in the internal exchanger
measured temperature with wet bulb (D.B.= DRY BULB)

Text = External exchanger inlet air temperature
wet bulb temperature (W.B.= WET BULB)

Within its operating range, the unit can work at a partialized load to maximise energy efficiency

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

In prolonged heat pump mode with an ambient temperature below 6°C, the unit carries out defrosting cycles with cycle inversion to eliminate the ice that forms on the surfaces of the external exchanger. Moreover, in the event of negative temperatures, it is important to promote the evacuation of water produced by defrosting to avoid the accumulation of ice near the base of the unit. Ensure this does not pose a hazard to property or persons.

With outdoor air temperatures between -10°C and -25°C, the following options will be required:
- Hot water coil / Gas heating module
- Application for low outdoor temperature

Option compatibility

This table reports the list of accessories that can be configured and their compatibility with CKN-iM.

OPTIONS OF THE CKN-iM SERIES				
RIF.	**DESCRIPTION**	**CAK**	**CBK**	**CCK-REVO**
	Configurations			
REVO	Exhaust air thermodynamic energy recovery (CCK-REVO)	-	-	√
	Versions			
CHW2	Two-rows hot water coil	O	O	O
3WVM	3-way modulating valve	O	O	O
2WVM	2-way modulating valve	O	O	O
EH	Electric heaters	O	O	O
GCX	Condensig gas heating module with modulating control	◊	◊	◊
HSE	Immersed electrodes steam humidifier	O	O	O
PUE	External Humidifier management with 0-10V signal	O	O	O
	Installation			
M0	Horizontal air supply	√	√	√
R0	Horizontal air return	√	√	√
AMRX	Rubber antivibration mounts	◊	◊	◊
AMRMX	Rubber antivibration mounts for unit and gas module	◊	◊	◊
PGCCH	Anti-hail protection grilles	O	O	O
LTEMP1	Application for low outdoor temperature	O	O	O
	Refrigeration circuit			
CINV	Inverter compressors	√	√	√
EVE	Electronic expansion valve	√	√	√
CPHG	Hot gas re-heating coil	O	O	O
RPRC	Compressors vane refrigerant leak detector	O	O	O
RPRMX	Remote supply duct refrigerant leak detector	◊	◊	◊
RPRCMX	Remote supply duct refrigerant leak detector and compressors vane refrigerant leak detector	◊	◊	◊
	Aeraulic circuit			
FC	Thermal FREE-COOLING	-	-	√
FCE	Enthalpic FREE-COOLING	-	-	O
EXFLOWC	Application in spaces with forced air exhaust at variable flow and exhaust section	-	-	O
SER	Manual outdoor air damper	-	√	-
SERM	Outdoor air motorized on/off damper	-	O	-
SERMD	Modulating motorized outdoor air damper	-	O	√
VENH	High static pressure fans	O	O	O
CREFB	ECOBREEZE type outdoor section fans consumption reduction device	√	√	√
PVAR	Variable airflow	O	O	O
PCOSM	Constant supply airflow	O	O	O

√ Standard component
O Optional component
◊ Accessory separately supplied (optional)
- Not available

RIF.	DESCRIPTION	CAK	CBK	CCK-REVO
	Aeraulic circuit			
PVARDP	Variable airflow with pressure probe on the unit	0	0	0
PVMV	4-20mA signal for the supply airflow modulation	0	0	0
PAQC	Air quality probe for CO_2 rate check	-	0	0
PAQCV	Air quality probe for CO_2 and VOC rate check	-	0	0
PAQC2	Double air quality probe for CO_2 rate check	-	0	0
PAQCV2	Double air quality probe for CO_2 and VOC rate check	-	0	0
PPAQC	External CO_2 signal management	-	0	0
FPG4	Pleated air filter class G4 (ISO 16890 Coarse 60%)	√	√	√
F7	High efficiency F7 air filter (ISO 16890 ePM1 55%)	0	0	0
F9	High efficiency F9 air filter (ISO 16890 ePM1 80%)	0	0	0
PSAF	Differential pressure switch for dirty air filters	0	0	0
	Electric circuit			
CMSC9	Serial communication module for Modbus supervisor	√	√	√
CMSC13X	Serial communication module for Modbus TCP/IP, BACnet IP and BACnet MSTP supervisors	◊	◊	◊
CRC	Remote control with user interface	√	√	√
CTT	Temperature control with thermostat	0	0	0
CTEM	Ambient temperature control with built-in probes	√	√	√
CSOND	Ambient temperature and humidity control with built-in probes	0	0	0
MDMTX	Management of ambient temperature probes	◊	◊	◊
MDMTUX	Management of temperature and humidity ambient probes	◊	◊	◊
MDMADX	Advanced monitoring and management ambient probes	◊	◊	◊
IOTI	IoT industrial module for cloud based interoperability & services	0	0	0
PM	Phase monitor	√	√	√
DESM	Smoke detector	0	0	0
CONTA2	Energy meter	0	0	0
CHMET	Cooling and Heating Capacity Meter	0	0	0
DML	Demand limit		0	0
	Various			
PTCO	Set up for shipping via container	0	0	0

√ Standard component
O Optional component
◊ Accessory separately supplied (optional)
- Not available

The temperature of the unit is controlled as standard with the temperature probe installed in the return section of the unit.
In the case of configuration with options such as FCE "Enthalpy Free-cooling", HSE "Immersed electrodes steam humidification", PUE "External Humidifier management with 0-10V signal" and CPHG "Hot gas post-heating coil", additional humidity probes are installed in the unit.
Thermoregulation can also be carried out with the controller supplied as standard or the remote probes available as optional components.

Standard functions

FC — **Thermal FREE-COOLING**

Standard option for the configuration CCK-REVO.
It reduces energy consumption and wear of the compressor by using outdoor air as an energy source to reduce thermal loads in the indoor environment. The thermoregulation compares the temperature of the outdoor environment and the indoor environment by defining the amount of fresh air required to guarantee the temperature set-point while keeping the compressors off or at reduced load.

CREFB — **ECOBREEZE type outdoor section fans consumption reduction device**



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 operating conditions of the cooling circuit. Reducing the speed at which the thermal load decreases ensures clear benefits in terms of noise emissions especially at night when people can be most sensitive to noise. 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 continuous cooling operation even at temperatures below 15°C, the option is necessary to maintain correct condensation on the external heat exchanger.

CTEM — **Ambient temperature control with built-in probes**

Thermoregulation is carried out on the conditions of the return airflow.

SER — **Manual outdoor air damper**

Standard option for the configuration CBK.
The damper on the outdoor section does not change position depending on the operating state and it is opened at the manually predefined both when the unit is switched on and when the unit is switched off.

SERMD — **Modulating motorized outdoor air damper**

The modulating motorised outdoor air damper is standard for CCK-REVO configuration and available as an option for CBK configuration.
When the external conditions are favourable, the FREE-COOLING mode is activated and the external air damper is modulated to meet the internal set-point.

CMSC9 — **Serial communication module for Modbus supervisor**

Allows serial connection to supervision systems, using Modbus as a communication protocol. It allows the access to the entire list of operation variables, controls and alarms. With this accessory, every unit can communicate with the main supervision systems. The device is installed and wired on the unit.

⚠ The total length of each individual serial line must not exceed 1000 m and the line must be connected in bus type (input/output).

PM — **Phase monitor**

The phase monitor allows verifying the proper phase connection and their unbalance in the units powered by the 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. As soon as the nominal line conditions are restored, the unit is automatically reset. The device is installed and wired on the unit.

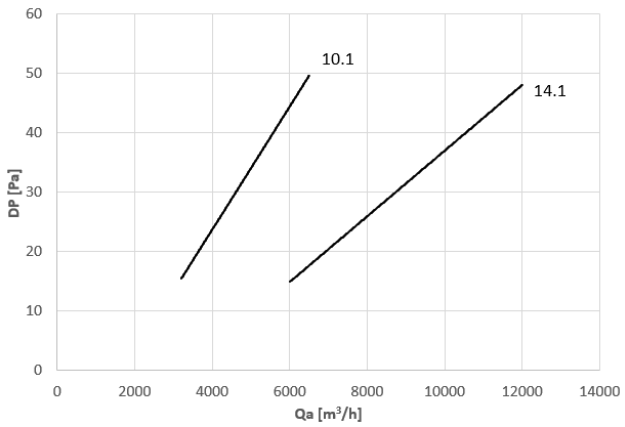
Accesories

CHW2 Two-rows hot water coil

Option indicated for very cold climates, as it allows to heat up the area served. The exchanger comes with a thermostat for the antifreeze function, which is always active even when the unit is in stand-by, as long as it is operated electrically. If required, force the opening of the valve to the maximum value allowed to allow the air to pass through the exchanger and prevent frost from forming.
The hot water coil allows the integration of the heat pump capacity, as being placed before the treating coil, it pre-heats the air, extending the operation limits of the unit. If the water coil operates as integration to the heat pump, the control logic reduces the potential at a pre-determined limit value, which prevents to make the compressors work at too high condensation temperatures. On the other hand, if the water coil is used as main resource (i.e. availability of the compressors) the potential supplied will be the highest.
In the event laws or local standards encourage the use of the district heating, and so the use of hot water coil heating with the obligation to recover the energy contained inside the exhaust air flow, a turning point can be set, that is an outside air temperature, below which the unit uses the water coil as main resource and operates also as thermodynamic recuperator at very high efficiency, using the nominal capacity of the heat pump circuit only partially.
This option provides a dry contact for starting a water circulation pump (to be carried out by the installer).

⚠ This option determines a reduction in the available static head (air side).
⚠ The component requires connection to the hot water plumbing system (to be provided for by the client).
⚠ "Two-rows hot water coil", "Electric heaters" and "Gas heating module" cannot be fitted at the same time.
⚠ " Two-rows water coil" and "immersed electrode steam humidifier" cannot be fitted at the same time.

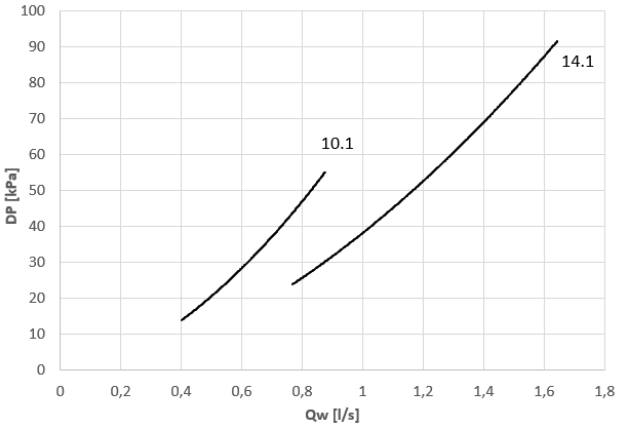
Air-side pressure drop



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

Qa [m³/h] = Airflow
DP [Pa] = Pressure drops

Water-side pressure drop



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

Qw [l/s] = Water flow-rate
DP = Pressure drops [kPa]

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

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

This option determines a reduction in the available static head (air side).

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

Accesories

CHW2

SIZE				Ti/To								
				80/65	70/55	60/40	80/65	70/55	60/40	80/65	70/55	60/40
10.1	Qo [m3/h]				3200			5000			6500	
	Qo [l/s]				889			1389			1806	
	Tin [°C]	5	kWt	39,8	33,8	25,7	53,8	45,5	34,5	63,6	53,8	40,7
			Tout	40,2	34,9	27,8	35,4	30,8	24,5	32,7	28,4	22,7
		10	kWt	36,9	30,8	22,7	49,7	41,4	30,4	58,8	49,0	35,8
			Tout	43,2	37,7	30,4	38,7	33,9	27,5	36,1	31,7	25,9
		14	kWt	34,5	28,4	20,2	46,5	38,2	27,1	55,0	45,1	31,9
			Tout	45,5	39,9	32,5	41,2	36,3	29,8	38,7	34,3	28,3
		16	kWt	33,3	27,2	19,0	44,9	36,6	25,4	53,1	43,2	29,9
			Tout	46,6	41,0	33,5	42,4	37,5	31,0	40,0	35,6	29,5
		18	kWt	32,1	26,0	17,7	43,3	35,0	23,7	51,1	41,3	27,9
			Tout	47,8	42,1	34,4	43,6	38,7	32,1	41,3	36,8	30,7
		20	kWt	30,9	24,8	16,5	41,6	33,3	22,0	49,2	39,4	25,9
			Tout	48,9	43,1	35,4	44,9	39,9	33,1	42,6	38,1	31,9
14.1	Qo [m3/h]				6000			9000			12000	
	Qo [l/s]				1667			2500			3333	
	Tin [°C]	5	kWt	75,4	64,0	49,1	99,2	84,1	64,2	119,4	101,2	77,1
			Tout	40,6	35,2	28,2	36,2	31,5	25,2	33,2	28,9	23,2
		10	kWt	69,8	58,4	43,4	91,8	76,7	56,7	110,5	92,2	68,0
			Tout	43,6	38,1	30,8	39,4	34,6	28,2	36,5	32,2	26,3
		14	kWt	65,4	53,9	38,8	85,9	70,7	50,6	103,3	85,0	60,6
			Tout	45,9	40,3	32,9	41,9	37,0	30,4	39,2	34,7	28,8
		16	kWt	63,1	51,7	36,5	82,9	67,7	47,5	99,7	81,4	56,9
			Tout	47,0	41,4	33,9	43,1	38,2	31,6	40,5	36,0	30,0
		18	kWt	60,9	49,4	34,1	79,9	64,8	44,5	96,2	77,8	53,2
			Tout	48,1	42,4	34,9	44,3	39,3	32,7	41,8	37,2	31,2
		20	kWt	58,7	47,2	31,8	77,0	61,8	41,4	92,6	74,2	49,5
			Tout	49,2	43,5	35,8	45,5	40,5	33,7	43,0	38,5	32,3

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 choke the 3-way modulating valve limiting the inlet air temperature at desired values.

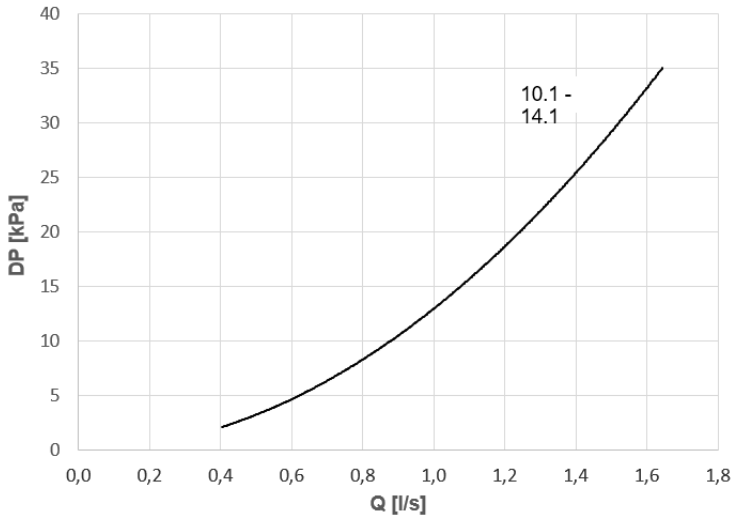
2WVM **2-way modulating valve**

3WVM **3-way modulating valve**

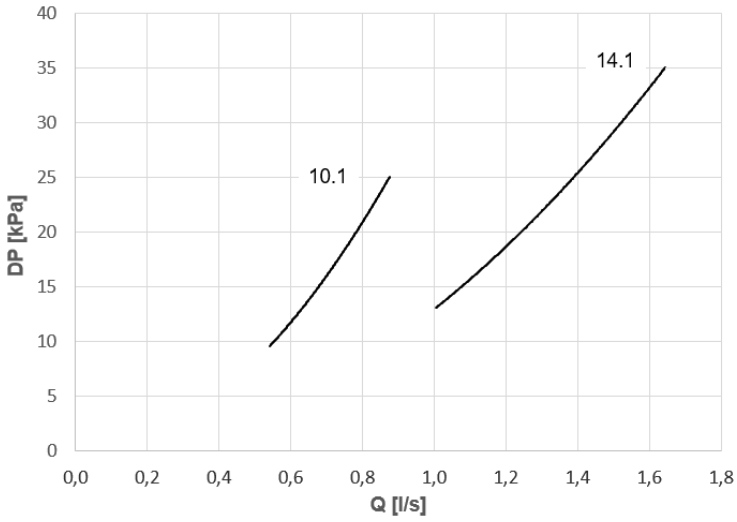


To be combined with hot water coil (optional). It is managed by the built-in microprocessor via a 0-10V signal and allows the fully automatic control of the water coil. The valve with modulating actuator is provided already assembled and wired built-in the unit.

2WVM pressure drops



3WVM pressure drops



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

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

Accesories

EH

Electric elements

This option is suggested for cold climates, allows the integration of heating capacity from the heat pump. The electrical heaters are placed before the treatment coil and perform the air preheating function, extending the operating range of the unit and helping quickly to reach the comfort in the room.
Ideal for climate areas in applications with low outside temperature where it is required to active the heaters only for short time in the year. In these cases the resulting system simplification (no water supply) compensates the energy costs.
The fins are made of aluminum, of suitable dimension to ensure high efficiency and maintain low power density on the surfaces to limit overheating. The low temperature of the heating elements increases the lifespan and limits the effect of air ionization.

Matching of the electric elements

Size	10.1	14.1
6 kW	√	-
9 kW	√	-
13,5 kW	√	√
18 kW	-	√
24 kW	-	√

⚠ This operation involves variation of the main electrical data of the unit.
⚠ "Heating elements", "Condensig gas heating module with modulating control" and "Two rows hot water coil" cannot be fitted at the same time.

Operation field extension with electric heaters DT (°C)

SIZE	Air flow rate [m³/h]	6 kW	9 kW	13,5 kW	18 kW	24 kW
10.1	5000	3,6	5,4	8,1	-	-
14.1	9000	-	-	4,5	6	8

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

HSE

Immersed electrodes steam humidifier



This device is suitable for winter operation when humidity is required for the ambient without cooling the air flow. The automatic modulating control allows you to adjust the steam production and its relative management costs to the actual requirements.
Available in different capacities, the device is suitable for using soften water having medium conductivity and is equipped with: water load solenoid valve, disposable cylinder, water drainage solenoid valve, distribution nozzle, control electronic board to verify the water level, conductivity, anti-foam device, water drainage manual forcing. To ensure maximum hygiene, the cylinder can automatically empty after a determined period of stand-by.
The accessory is installed inside the unit and is connected to the electrical panel of the unit.
Ambient humidity is measured by means of a return humidity probe, which is provided already assembled and wired built-in the unit.
With the option is available a potential-free contact for the water emptying during the period in which the unit is not used (connection provided by the Customer).

Matching of immersed electrode and steam humidification module

Size	10.1	14.1
3 kg/h	√	√
5 kg/h	-	√
8 kg/h	-	√

⚠ This operation involves variation of the main electrical data of the unit.
⚠ This accessory requires the presence of a water circuit and drain on the unit. Responsibility of the customer.
⚠ Operation available only in heating mode
⚠ Two-rows hot water coil" and "immersed electrode steam humidifier" cannot be fitted at the same time.
⚠ Application for low outdoor temperature" and "Immersed electrode steam humidifier" cannot be fitted at the same time.

PUE

External Humidifier management with 0-10V signal

Solution suitable for applications where there is a humidification section external supplied by a third party. The external humidifier is operated with the 0-10V signal coming from the unit.

PGCCH

Anti-hail protection grilles

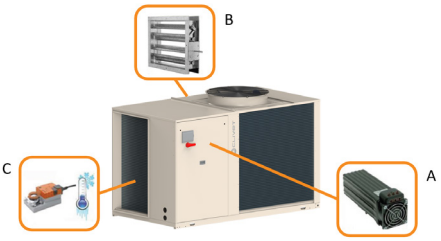
Option to install protective grilles on the external exchangers (source side). The grille has a protective function to prevent vandalism and to protect against atmospheric agents such as hail, without altering heat exchange. It consists of a rigid wire mesh with a 12.5 mm mesh pitch and RAL7073 grey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

Accesories

LTEMP1 Application for low outdoor temperature

Option indicated for very cold climates, where the outside temperature can be between -10°C and –25°C.

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

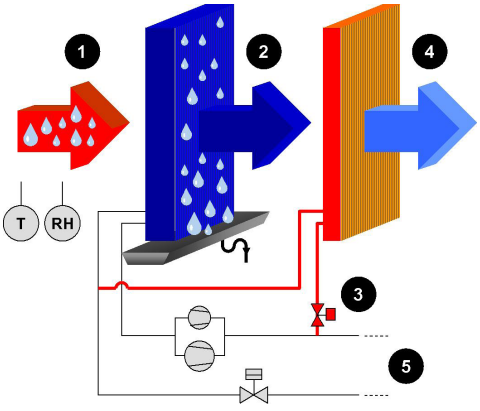


⚠ This operation involves variation of the main electrical data of the unit.
⚠ This accessory operates even when the unit is switched off provided that the power supply is maintained active and the unit continues to be connected.
⚠ It is necessary to make precautions against build up of snow and ice in front of the exhaust and outdoor air inlet locations.
⚠ Application for low outdoor temperature" and "Immersed electrode steam humidifier" cannot be fitted at the same time.

CPHG Hot gas re-heating coil

This option is recommended during the summer when the intake 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 after the handling coil and is activated by diverting a flow of hot refrigerant gas downstream from the compressors through the action of a dedicated solenoid valve
The process starts up according to the humidity set-point specified by the user.
With respect to traditional devices, such as electrical electric elements or hot water coils, use of the re-heat coil does not consume any extra energy. It also lowers refrigerant condensation temperature, which provides two positive effects: power absorbed by the compressors is considerably reduced, and at the same time, cooling capacity is increased, resulting in greater efficiency (EER).
Ambient humidity is measured by means of a return humidity probe, which is provided already assembled and wired built-in the unit.

⚠ This option determines a reduction in the available static head (air side).



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

Indicative scheme - not in scale

CPHG

SIZE				OUTDOOR AIR TEMPERATURE [°C]														
				25	27	30	32	35	25	27	30	32	35	25	27	30	32	35
	Qo [m3/h]			3200					5000					6500				
	Qo [l/s]			889					1389					1806				
10.1	Tin [°C]	10	kWt	11,9	12,7	14,0	14,8	16,1	15,5	16,6	18,3	19,4	21,1	18,0	19,3	21,3	22,5	24,4
			Tout	20,7	21,5	22,6	23,4	24,5	18,9	19,6	20,6	21,2	22,2	18,0	18,6	19,4	20,0	20,8
		12	kWt	11,0	11,9	13,2	14,0	15,3	14,4	15,5	17,2	18,3	20,0	16,7	18,0	20,0	21,3	23,2
			Tout	22,0	22,8	23,9	24,7	25,9	20,4	21,0	22,0	22,6	23,6	19,5	20,1	20,9	21,5	22,3
		14	kWt	10,2	11,1	12,3	13,2	14,5	13,3	14,4	16,1	17,2	18,9	15,5	16,8	18,7	20,0	22,0
			Tout	23,3	24,1	25,3	26,0	27,2	21,8	22,4	23,4	24,1	25,1	21,0	21,5	22,4	23,0	23,9
		16	kWt	9,4	10,2	11,5	12,3	13,6	12,2	13,4	15,0	16,1	17,8	14,2	15,5	17,4	18,7	20,7
			Tout	24,6	25,4	26,6	27,4	28,5	23,2	23,9	24,8	25,5	26,5	22,4	23,0	23,9	24,5	25,4
		18	kWt	8,5	9,4	10,7	11,5	12,8	11,2	12,3	13,9	15,1	16,7	12,9	14,2	16,2	17,5	19,4
			Tout	25,9	26,7	27,9	28,7	29,9	24,6	25,3	26,3	26,9	27,9	23,9	24,5	25,4	26,0	26,9
		20	kWt	7,7	8,6	9,8	10,7	12,0	10,1	11,2	12,8	14,0	15,6	11,7	13,0	14,9	16,2	18,2
			Tout	27,2	28,0	29,2	30,0	31,2	26,0	26,7	27,7	28,3	29,3	25,4	26,0	26,8	27,4	28,3
	Qo [m3/h]			6000					9000					12000				
	Qo [l/s]			1667					2500					3333				
14.1	Tin [°C]	10	kWt	21,3	22,9	25,3	26,9	29,3	27,3	29,3	32,4	34,4	37,5	32,2	34,6	38,1	40,4	43,8
			Tout	20,3	21,0	22,2	22,9	24,1	18,7	19,4	20,4	21,0	22,0	17,7	18,3	19,2	19,7	20,5
		12	kWt	19,8	21,4	23,8	25,4	27,8	25,3	27,3	30,4	32,4	35,5	29,8	32,2	35,8	38,2	41,6
			Tout	21,6	22,3	23,5	24,3	25,4	20,1	20,8	21,8	22,5	23,5	19,2	19,8	20,7	21,2	22,1
		14	kWt	18,2	19,8	22,2	23,8	26,2	23,2	25,3	28,4	30,4	33,5	27,4	29,8	33,5	35,9	39,4
			Tout	22,9	23,6	24,8	25,6	26,8	21,6	22,2	23,2	23,9	24,9	20,7	21,3	22,2	22,7	23,6
		16	kWt	16,6	18,2	20,6	22,2	24,6	21,2	23,3	26,4	28,4	31,5	25,0	27,4	31,1	33,5	37,1
			Tout	24,2	24,9	26,1	26,9	28,1	22,9	23,6	24,6	25,3	26,3	22,1	22,7	23,6	24,2	25,1
		18	kWt	15,1	16,7	19,1	20,7	23,1	19,2	21,3	24,3	26,4	29,5	22,7	25,1	28,7	31,1	34,8
			Tout	25,4	26,2	27,4	28,2	29,4	24,3	25,0	26,0	26,7	27,7	23,6	24,2	25,1	25,7	26,6
		20	kWt	13,5	15,1	17,5	19,1	21,5	17,2	19,3	22,3	24,4	27,5	20,3	22,7	26,3	28,8	32,4
			Tout	26,7	27,5	28,7	29,5	30,7	25,7	26,4	27,4	28,1	29,1	25,0	25,6	26,5	27,2	28,1

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 post-heating coil is powered by the hot gas, drawn by the supply pipe.
As the condensation hot gas temperature is linked to the outdoor air temperature, the indicative potentials of the post-heating coil are expressed according to the outdoor air temperature
The performances of the hot gas post-heating coil refer to the cooling operation of the unit at full load.

Accesories

RPRC **Compressors vane refrigerant leak detector**

The unit comes with a leak detector installed in the compressor compartment. The appropriate and targeted design of the unit makes it possible to reduce the risk of leakage in general, and to concentrate the residual risk in the compressor compartment.
The combination of this factor and the still air inside the compartment makes the device effective and prompt in detecting any leaks.
Activation threshold at concentrations >15% LFL.
If a leak is detected, the unit is immediately switched off and a specific alarm is displayed.
In addition to the attention to environmental impact, this solution serves to reduce the frequency of periodic checks required by the F-GAS directive.

- ⚠ The unit is designed in compliance with the minimum requirements of EN 378-2. The adoption of this device is redundant given the minimum requirements.
- ⚠ With reference to the use of A2L refrigerants, the application and installation of these units must comply with the safety standards of EN 378.
- ⚠ The presence of this detector has no impact on the definition of the minimum surface areas required for the ambients served.
- ⚠ The device is not part of the unit's primary safety chain

FCE **Enthalpy FREE-COOLING**

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

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

Option indicated for CCK-REVO configuration, for conditioning buildings with hoods or active air exhaust systems, for example catering kitchens, labs with suction hoods, where the fresh airflow is variable in function of the number of active extractors.
The option involves an electronic device installed built-in the unit that receives the activation status of the extractors on appropriate potential-free, through a single 4-20 mA signal or from a BMS signal. The amount of fresh air is modulated according to these inputs.
The unit is equipped with an exhaust fan section to allow air renewal even when the extractor hoods are switched off. The exhaust section is equipped with a plug-fan electronically controlled and managed by the machine logic according to the active exhaust hoods and the opening of the external air damper. When sizing the unit, consider 50% of the rated capacity as the maximum extraction capacity of the hoods. The air quality probe for controlling the rate of CO_2 / CO_2 and VOC and 'Set-up for rooms with variable capacity forced extraction and exhaust section' cannot be selected at the same time.
Where necessary, the unit will be integrated with further pre-heating options of which "Electrical heating resistance", "two-rows hot water coil" or "Gas heating module" to guarantee the operation of the unit with 50% of the fresh air in every operating situation, even at low outdoor air temperature.

- ⚠ The electronic device is installed and wired built-in the unit.
- ⚠ The option allows to manage up to 4 ON-OFF contacts from the exhaust devices or one 4-20 mA or via BMS signal (by Customer).
- ⚠ The connection cables for the 4-20 mA signal or the ON-OFF status do not require shielding.
- ⚠ The EXFLOWC option is not compatible with the 'PVARDP Variable air flow with pressure probe on the unit' and 'PVMV 4-20 mA signal for supply airflow modulation' and 'PPAQC External CO_2 signal management options.
- ⚠ With minimum fresh air temperatures between 0°C and –8°C foresees the option "Electrical heating resistance" or "two-rows hot water coi" whereas for minimum temperatures between –8°C e –30°C foresees the "two-rows hot water coil" or "Gas heating module" option.

SERM **Outdoor air motorized on/off damper**

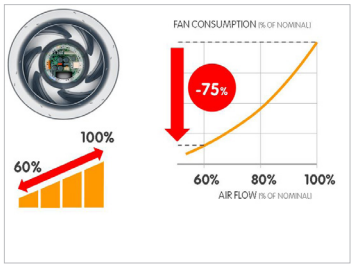
Option available for CBK configuration.
The position of the external air damper is closed when the unit is switched off to avoid leakage, and during the commissioning phase to reach the set-point more quickly. When the unit is switched on and running, it opens and allows the passage of the set flow of outdoor air.

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, choosen 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.
This operation involves variation of the main electrical data of the unit.

PVAR **Variable airflow**

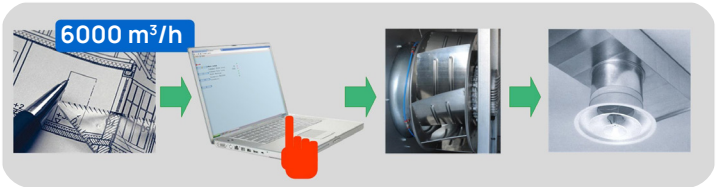


Option that enables the automatic variation of the treated air flow, according to the effective load. This allows great energy saving, thanks to the reduction of ventilation electrical consumptions. The minimum flow value equal to 60% of the nominal one occurs during the partial load and satisfied set-point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

⚠ This option already includes the device for controlling the airflow, called 'PCOSM - Constant supply airflow', which must not be selected
⚠ When sizing the distribution and diffusion of the air, keep into consideration that the airflow varies from the nominal value (at full load, in FREE-COOLING mode and during the defrosting phases) to the minimum value, equal to 60% of the nominal flow (at partial load)

PCOSM **Constant supply airflow**

The original technology adopted removes all the settings required on site on traditional fans, as well as the relative time and costs. The desired flow is set on the display and automatically maintained by the unit, adjusting the speed of the ventilating sections. During installation and start-up, the unit adapts to the relative pressure drops of the air distribution system. Furthermore, throughout the entire operating life, this system automatically compensates for the gradual build-up of dirt on the air filters.



Accesories

PVARDP **Variable airflow with pressure probe on the unit**

This option is recommended in applications for multi zone where is required the variability of the air flow, in according on the actual conditions of use in some rooms. Suitable for aeraulic system equipped with VAV/CAV dampers.
In case of variation of the aeraulic load profile of the system, it allows to automatically change the air flow rate to maintain the set external static pressure.

⚠ For effective control, the set external static pressure must be higher than 100 Pa
⚠ The change in supply flow must fall within the range of permitted flows for the selected model.

PVMV **4-20mA signal for the supply airflow modulation**

Through this option, the supply airflow can be adjusted through a single external 4-20mA signal.
A suitable solution in systems serving several rooms having similar heat load profiles, but it is separated from each other and occupied in a discontinuous way.
In periods of sanitary emergency, it is suitable for managing a lower airflow than the nominal one, as well as keeping the system on at night, thereby ensuring that internal pollutants are continuously diluted.
The airflow can linearly vary according to the signal received; these values must be within the range of the airflow rates allowed for the selected model.

⚠ PVMV is not compliant with 'PCOSM - Constant supply airflow', 'PVAR - Variable airflow' and 'PVARDP - Variable airflow with pressure probe on the unit'

PAQC **Air quality probe for CO_2 rate check**



Option suitable for environments with highly variable crowding. The probe detects the amount of CO_2 in the area and sends a proportional signal to the unit logic. Based on the signal received, the unit's control system regulates the supply of the correct volume of fresh air, thereby avoiding wasted energy and money on treating a volume of outdoor air that exceeds actual requirements.
The probe is installed and wired built-in the unit and is located in the return air duct of the unit.

⚠ This solution can only be provided in combination with 'SERMD Modulating motorized outdoor air damper'

PAQCV **Air quality sensor for CO_2 and VOC rate check**

Option shown in environments characterized by tobacco smoke, formaldehyde (coming for example from solvents, deodorants, glues, paints, detergents), cooking, etc. The probe detects the amount of CO_2 and VOCs (volatile organic compounds) in the area and sends a proportional signal to the unit logic. Based on the signal received, the unit's control system regulates the supply of the correct volume of fresh air, thereby avoiding wasted energy and money on treating a volume of outdoor air that exceeds actual requirements.
The probe is installed and wired built-in the unit and is located in the return air duct of the unit.

⚠ This solution can only be provided in combination with 'SERMD Modulating motorized outdoor air damper'

PAQC2 **Double air quality probe for CO_2 rate check**

Option suitable for environments with highly variable crowding and outdoor pollution.
The option entails two CO_2 probes: one on board the unit and one outside the building. Depending on the two concentrations recorded, the unit logic intervenes to introduce the correct air flow or no fresh air at all.

⚠ This solution can only be provided in combination with 'SERMD Modulating motorized outdoor air damper'

PAQCV2 **Double air quality probe for CO_2 and VOC rate check**

Option suitable for environments with highly variable crowding and outdoor pollution and containing tobacco smoke, formaldehyde (e.g. from solvents, deodorants, glues, paints, detergents), cooking food, etc.
The option entails two CO_2+VOC (Volatile Organic Compound) probes: one on board the unit and one outside the building. Depending on the two concentrations recorded, the unit logic intervenes to introduce the correct air flow or no fresh air at all.

⚠ This solution can only be provided in combination with 'SERMD Modulating motorized outdoor air damper'

PPAQC **External CO_2 signal management**

The unit is configured with a 0-10V input available for the proportional control of the amount of fresh air according to a signal from a CO_2 detection system to be taken care of by the customer.

⚠ This solution can only be provided in combination with 'SERMD Modulating motorized outdoor air damper'

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

F9 **High efficiency F9 air filter (ISO 16890 ePM1 80%)**



Class F7/F9 filters are additional filtration components along with the standard G4 filters for more efficient filtration. They are widely used in civil air conditioning systems and in industrial applications requesting an adequate yield with respect to fine dust and particles larger than 1 µm. Class F7/F9 filters are made of folded fibreglass paper with constant calibrated spacing, mounted on a metal frame; the large filtering surface is designed to keep air side pressure drops low. Class F7/F9 filters must be replaced after reaching clogging limits with scheduled periodic maintenance. It is possible to provide, as an option, the differential pressure switch for dirty filters to inform the user that the permissible clogging limit has been reached to avoid an excessive reduction in the airflow rate compared to the rated value.

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

PSAF **Differential pressure switch for dirty air filters**

It detects and signals when the maximum level of clogging of the air filters has been reached. This alerts the machine operator when maintenance of the filters is required. The detection device is installed in the unit and already connected to the electrical panel of the machine and pre-calibrated in the factory. The calibration can be modified by authorised personnel.

CTT **Temperature control with thermostat**

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

⚠ This solution is not compatible with the FCE (enthalpy FREE-COOLING), CPHG (Hot gas post-heating coil) and HSE (Immersed electrode steam humidifier) options and PUE (External Humidifier management with 0-10V signal).
⚠ The thermostat has to be installed in a representative position of the services room conditions.

CSOND **Ambient humidity and temperature control with built-in probes**

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

Accesories

IOTX

IoT industrial module for cloud based interoperability & services

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

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

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

DESM

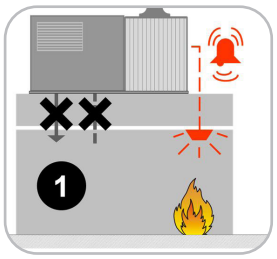
Smoke detector



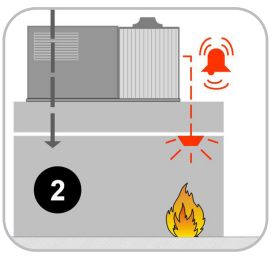
This option allows detection of smoke in the room by analyzing the return air. The Tyndal-effect increased sensitivity smoke detector is perfect for ventilation ducts since it is able to detect rarefied smoke in high-speed air flows. Smoke detection occurs using a photo-optical system with a labyrinth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

Control logics in the event of alarm signal

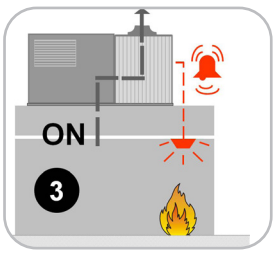
COMPLETE UNIT SHUTDOWN



SPACE IN OVERPRESSURE



SPACE IN UNDERPRESSURE



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

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

CONTA2

Energy meter

Allows to display and record the unit's main electrical parameters.
The data can be displayed with the user interface on the unit or via the supervisor through the specific Modbus protocol. It is possible to control:

- voltage (V),
- absorbed current (A),
- frequency (Hz),
- phase shifting cos ϕ
- power input (kW),
- absorbed energy (kWh),
- harmonic components (%)

- ⚠ The device is installed and wired on the unit.
- ⚠ This device is an accurate meter with CE certification; not suitable for legal metrology findings.

CHMET **Cooling and Heating Capacity Meter**

System to calculate the heating and cooling capacity by measuring the enthalpy of the supply and return air and the outdoor environment, as well as the indirect measurement of the supply and fresh airflow.
The data can be read directly on the device or through the supervision system with a ModBus communication protocol.

⚠ The device is installed and wired on the unit.
⚠ The capacities detected are to be considered indicative of the operation and the actual work point of the unit and are not comparable to the accuracy of the precise laboratory performance data declared in the Technical Bulletin.

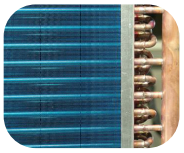
DML **Demand Limit**

Partial or total activation of the compressors - and electric heaters where present - can be disabled to limit the overall power input. The Demand Limit can be controlled via the BMS, with a parameter or an external 0–10 V signal. The greater the signal, the lower the power that the unit is enabled to deliver, activating the compressors and the electric heaters. The Demand Limit function does not affect the control or ventilation systems, which are always guaranteed to operate. The other auxiliary heating systems, on the other hand (if fitted), are disabled.

PTCO **Set up for shipping via container**

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

CCCA **Copper / aluminium coil with acrylic lining**



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

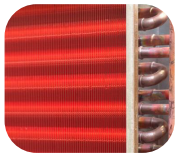
⚠ Configurable coating for all the coils of the refrigerant circuit (Handling, Source, Hot gas post-heating - CPHG).
⚠ Water coil (CHW) finish available on request.

CCCA1 **Copper/aluminium coil with Fin Guard finish (Silver)**

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 air with low saline concentrations or other chemical agents. The options are available for:
- external coil;
- internal coil;
- hot water coil;
- re-heating coil.

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

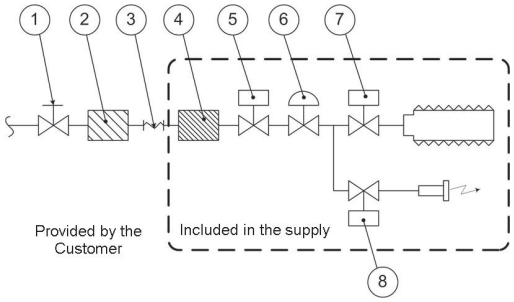
Accessories separately supplied

GCX **Condensing gas heating module and modulating control**

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

- condensing hot air generator with integrated modulating control, fuelled by natural 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

Combinations with condensation gas heating module

	Power	10.1	14.1
GC01X	35 kW	√	√
GC08X	44 kW	√	√
GC09X	65 kW	-	√

This option determines a reduction in the available static head (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.

⚠ "Heating elements", "Gas heating module" and "Two-rows hot water coil" cannot be fitted at the same time.

GCX Gas use features

		35 kW		44 kW		65 kW	
		min	max	min	max	min	max
Rated heating capacity	kW	7,6	34,8	8,5	41,0	12,4	65,0
Efficiency Hi (P.C.I.)	%	107,0	96,3	105,9	96,2	108,1	96,8
Efficiency Hs (P.C.S.)	%	96,4	86,8	95,4	86,7	97,4	87,2
Max condensation produced	l/h	0,9		1,1		2,1	
Carbon monoxide CO (0% di O_2)	ppm	<5		<5		<5	
Nitrogen oxides - NOx (0% di O_2)		"42 mg / kWh 24 ppm"		"33 mg / kWh 19 ppm"		"39 mg / kWh 22 ppm"	
Available flue pressure	Pa	90		90		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"	
Flue pipe diameter	mm	80		80		80	
Seasonal space heating energy efficiency [EU Reg./2281/2016] [ηsflow]	%	92,1		90,8		93,2	
Emission efficiency [EU Reg./2281/2016] [ηsflow]	%	97,3		97,0		97,4	
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

Accessories separately supplied

RPRMX **Remote supply duct refrigerant leak detector**

With this solution, the unit is supplied with a remote leak detector to be installed directly in the air duct. The position of the device allows for continuous monitoring of the air flow and the prompt identification of any leaks along the supply line.
Activation threshold at concentrations >15% LFL.
If a leak is detected, the unit is immediately switched off and a specific alarm is displayed.
In addition to the attention to environmental impact, this solution serves to reduce the frequency of periodic checks required by the F-GAS directive.

- ⚠ The unit is designed in compliance with the minimum requirements of EN 378-1. The adoption of this device is redundant given the minimum requirements.
- ⚠ With reference to the use of A2L refrigerants, the application and installation of these units must comply with the safety standards of EN 378-1.
- ⚠ The presence of this detector has no impact on the definition of the minimum surface areas required for the ambients served.
- ⚠ Installation by customer, refer to installation manual.

RPRCMX **Remote supply duct refrigerant leak detector and compressors vane refrigerant leak detector**

A solution comprising a detector in the compressor compartment and a remote detector on the supply line to ensure maximum coverage in the event of a leak.
Activation threshold at concentrations >15% LFL.
If a leak is detected, the unit is immediately switched off and a specific alarm is displayed.
In addition to the attention to environmental impact, this solution serves to reduce the frequency of periodic checks required by the F-GAS directive.
With reference to the use of A2L refrigerants, the application and installation of these units must comply with the safety standards of EN 378-1.
The presence of this detector has no impact on the definition of the minimum surface areas required for the ambients served.
The device is not part of the unit's primary safety chain
Installation by customer, refer to installation manual.

AMRX **Rubber antivibration mounts**



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

- ⚠ Installation is a responsibility of the Customer.

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

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

- ⚠ Installation is a responsibility of the Customer.

CMSC13X **Serial communication module for Modbus TCP/IP, BACnet IP and BACnet MSTP supervisors**

It enables connection to supervisory systems, using Modbus IP via an Ethernet port, BACnet-IP via an Ethernet port, or BACnet MSTP via an RS485 serial port as the communication protocol. It gives access to the entire list of operation variables, controls and alarms. The device is installed and wired on the unit.

⚠ The Customer is responsible for configuration and operation.

⚠ The total length of each individual serial line must not exceed 1000 m and the line must be connected in bus type

MDMTX **Management of ambient temperature probes**

1 to 4 remote environment temperature probes can be used with this option. The values recorded by the probes can be consulted on the remote control and with the available supervision systems.
The average of the values recorded by the probes can be used for thermoregulation.

⚠ Place the probes in a position that represents the conditions of the environment served.

MDMTUX **Management of temperature and humidity ambient probes**

1 to 4 remote room temperature and humidity probes can be used with this option. The values recorded by the probes can be consulted on the remote control and with the available supervision systems.
The average of the values recorded by the probes can be used for thermoregulation.

⚠ Place the probes in a position that represents the conditions of the environment served

MDMADX **Advanced monitoring and management ambient probes**



Selecting this option provides the advanced ambient condition monitoring system with a designer ambient interface. The remote probes are able to measure many parameters and provide a full picture of ambient conditions in terms of:

- Temperature and humidity
- Concentration of Carbon Dioxide (CO_2)
- Concentration of Volatile Organic Compounds (VOC)
- Concentration of Carbon Monoxide (CO)
- Concentration of Nitrogen Dioxide (NO_2)
- Concentration of Methane (CH_4)
- Sound level
- Atmospheric pressure

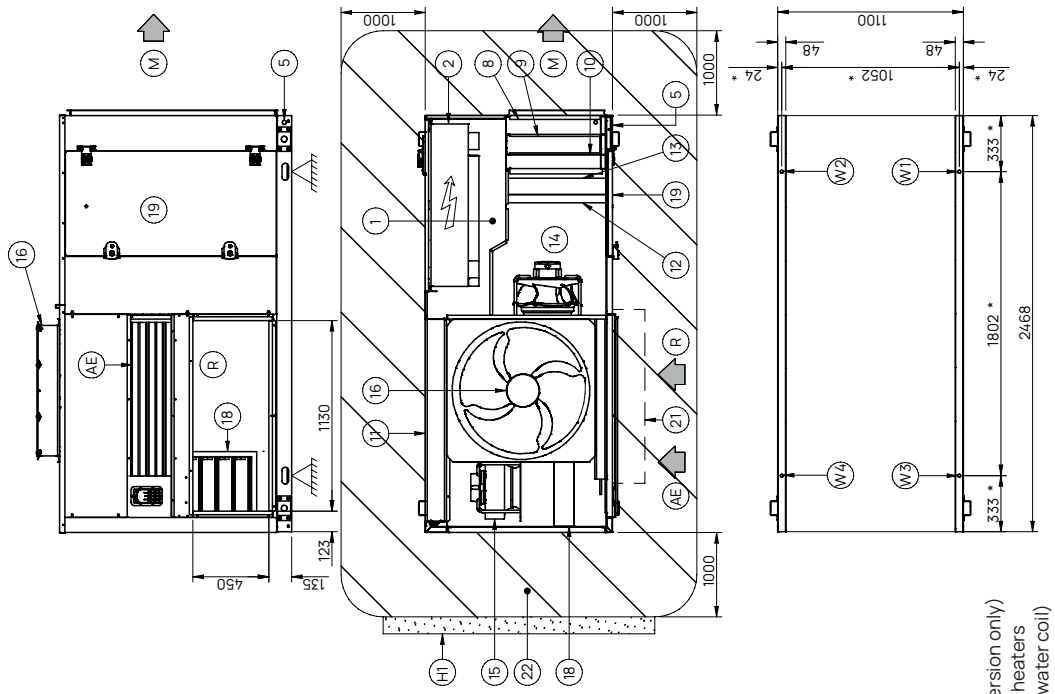
The parameters are recorded by the software and can be consulted via BMS or the Clivet Eye platform for PCs. Using the latter, in addition to accessing to each probe in detail, it is possible to visualize the trend of the recorded data of the last month and export the data of the 24 hours before a selected day.
The advanced monitoring devices comply with the requirements of LEED, WELL and Fitwell certifications.
The average of the values recorded by the probes (temperature and humidity) can be used for thermoregulation.

⚠ Place the probes in a position that represents the conditions of the environment served

Dimensional drawings

Size 10.1 - Configuration CAK / CCK-REVO

16127160022122
DATA/DATE 05/10/2026



WEIGHT DISTRIBUTION		CAK-CBK	CCK-REVO
W1 support poit	Kg	148	154
W2 support poit	Kg	126	131
W3 support poit	Kg	131	137
W4 support poit	Kg	142	149
Operating weight	Kg	547	571
Shipping weight	Kg	587	611

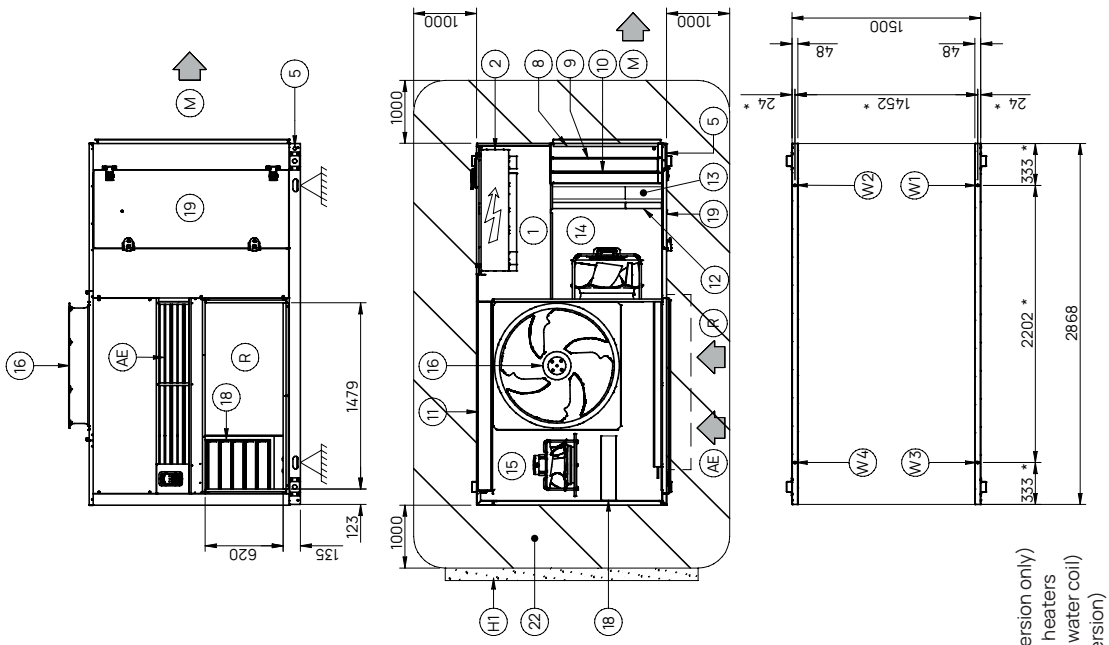
1. Compressor enclosure
2. Electrical panel
3. Power input
4. Humidifier connections
5. Condensate drain
6. Ø 3/4" H_2O heating coil outlet
7. Ø 3/4" H_2O heating coil inlet (optional)
8. Reheating coil (optional)
9. Internal exchanger
10. Water heating coil or electric heaters (optional)
11. External exchanger
12. 60% coarse filters (G4) (standard)
13. ePM1 55% (F7) / ePM1 80% (F9) filters (optional)
14. Electronic fan (Supply/Return)
15. Exhaust electronic fan (CCK-REVO version only)
16. External electronic fan
17. Lifting bracket (removed)
18. Overpressure exhaust damper (CCK-REVO version only)
19. Access for inspection of coils/filters/electric heaters
20. Access for inspection of the relief valve (hot water coil)
21. Outdoor air hood (only for CBK/CCK-REVO version)
22. Functional spaces

(R) Air return
(M) Air supply
(AE) Outdoor air
(H1) Wall with max. height equal to height of unit and on max. 3 sides
(*) Vibration mounts position

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

Size 14.1 - Configuration CAK / CBK / CCK-REVO

16127160022142
DATA/DATE 06/10/2026



WEIGHT DISTRIBUTION		CAK-CBK	CCK-REVO
W1 support poit	Kg	188	198
W2 support poit	Kg	160	169
W3 support poit	Kg	167	176
W4 support poit	Kg	181	191
Operating weight	Kg	696	734
Shipping weight	Kg	751	789

1. Compressor enclosure
2. Electrical panel
3. Power input
4. Humidifier connections
5. Condensate drain
6. Heating coil outlet H_2O ø 1"
7. Heating coil inlet H_2O ø 1"
8. Reheating coil (optional)
9. Internal exchanger
10. Water heating coil or electric heaters (optional)
11. External exchanger
12. 60% coarse filters (G4) (standard)
13. ePM1 55% (F7) / ePM1 80% (F9) filters (optional)
14. Electronic fan (Supply/Return)
15. Exhaust electronic fan (CCK-REVO version only)
16. External electronic fan
17. Lifting bracket (removed)
18. Overpressure exhaust damper (CCK-REVO version only)
19. Access for inspection of coils/filters/electric heaters
20. Access for inspection of the relief valve (hot water coil)
21. Outdoor air hood (only for CBK/CCK-REVO version)
22. Functional spaces

(R) Air return
(M) Air supply
(AE) Outdoor air
(H1) Wall with max. height equal to height of unit and on max. 3 sides
(*) Vibration mounts position

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

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For over 30 years we have been offering solutions to ensure sustainable comfort and the well-being of people and the environment

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