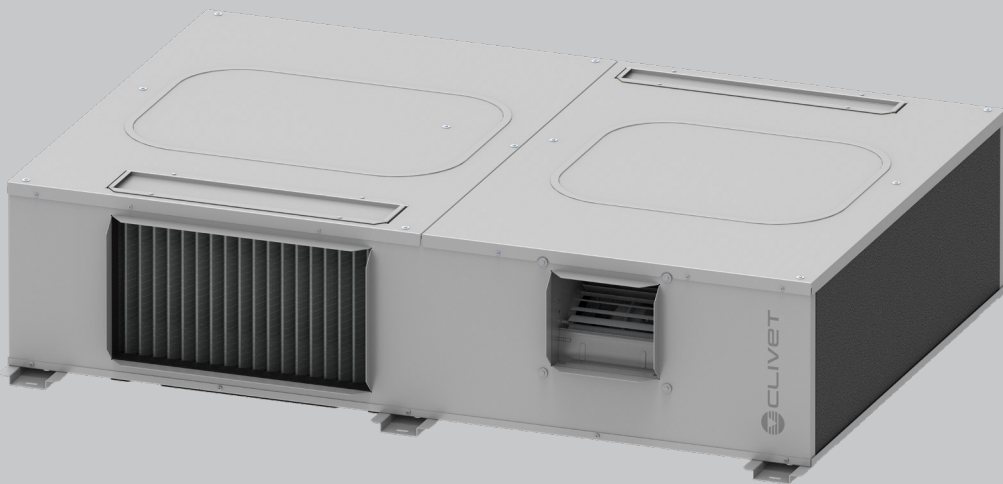


*Air renewal and purification
unit with active thermodynamic
recovery for indoor installation*

Fresh Large EVO

CiSDN-Y EF 1 S Size1 – Size3 RANGE

TECHNICAL BULLETIN



SIZE	SIZE1	SIZE2	SIZE3
Nominal flow-rate m ³ /h	500	1000	2000
Cooling capacity kW	1,9	3,6	7,4

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Features

HVAC systems: why?

In order to ensure thermo-hygrometric comfort for people living and working in buildings, HVAC (Heating, Ventilation and Air Conditioning) systems are used to:

- compensate for the energy exchange by transmission through the casing surfaces;
- overcome internal loads;
- reduce the load on outdoor air (ventilation) that can be introduced by natural ventilation or through dedicated systems (VMC).

The role of ventilation

- We spend more than 90% of our time in confined environments,
- improved building insulation reduces uncontrolled air infiltration, resulting in an increase in the concentration of indoor pollutants (up to 50 times higher than outdoor air).

With these assumptions, the importance and energy impact of mechanical ventilation, air filtration and exhaust air energy recovery systems for high indoor air quality (IEQ – Indoor Environmental Quality) has increased dramatically.

Fresh Large EVO, full coverage of ventilation loads and contribution to the building's air conditioning

CiSDN-Y EF 1 S units are fully independent fresh air units, equipped with outdoor and exhaust air management and filtration with full inverter thermodynamic recovery at low environmental impact.

The units are designed for large floor surface area residential and small commercial applications, and is the ideal solution for:



upgrading the efficiency of existing buildings



installation in new builds

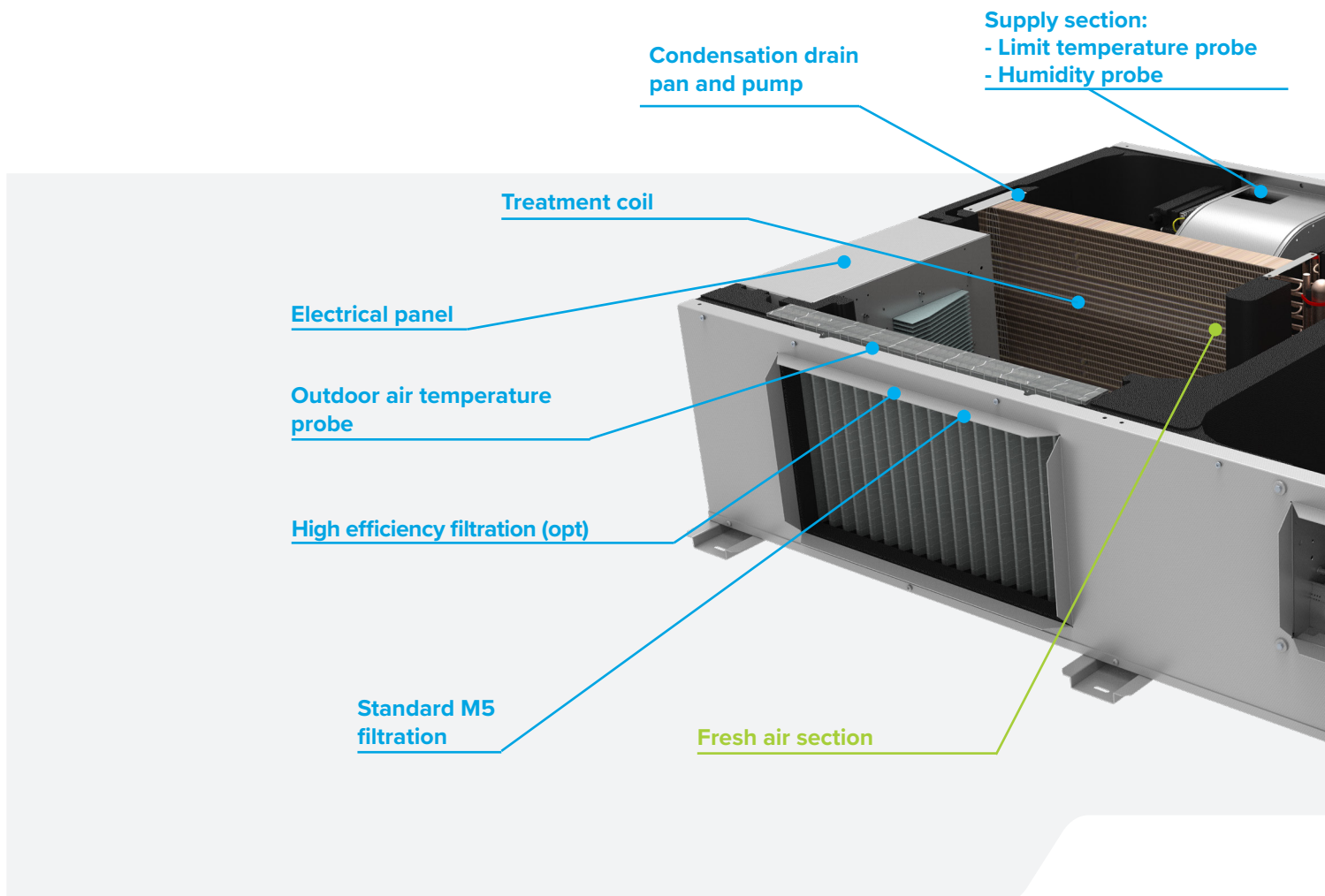
By making full use of the energy in the exhaust air, these units ensure high efficiency all year round, not only neutralising fresh air loads, but also supplying cooler air in summer and warmer air in winter compared to indoor conditions; this results in fulfilling set-points more quickly and reducing the energy request on the main air conditioning system.

Thanks to the packaged design, all the components are housed inside the unit, already assembled and tested.

- ✓ Single refrigeration circuit with inverter-controlled compressor for continuous modulation of the capacity provided, adapting exactly to the heat load of the fresh air.
- ✓ Centrifugal fans coupled with EC brushless motors ensure the desired air flow-rate by adapting to both the supply and exhaust of the aeraulic distribution system.
- ✓ Standard M5 supply and return filtration, with advanced filtration available.
- ✓ Automatic and variable control of the amount of fresh air based on the actual requirement of occupants, with air quality probe.
- ✓ Free cooling function, to introduce outdoor air directly when conditions are favourable, without needing specific bypass systems.
- ✓ Summer dehumidification function to help cover the latent load in the room.
- ✓ Possibility of remote management using Control4 NRG, Clivet EYE and INTELLIAIR, connection to main supervision systems with MODBUS protocol, and integration in VRF control systems.

Ventilation and purification

- ✓ Extracts and expels stale air
- ✓ Supplies 100% fresh air while keeping the air flow completely separate, without contamination with exhausted stale air
- ✓ EC fans with automatic adjustment to ensure a constant flow-rate over time
- ✓ Variable flow-rate based on the concentration of CO₂
- ✓ Second flow-rate setpoint from external signal
- ✓ Silent modes for the utmost acoustic comfort
- ✓ High efficiency filtration (opt)



Ideal for both existing buildings and new builds

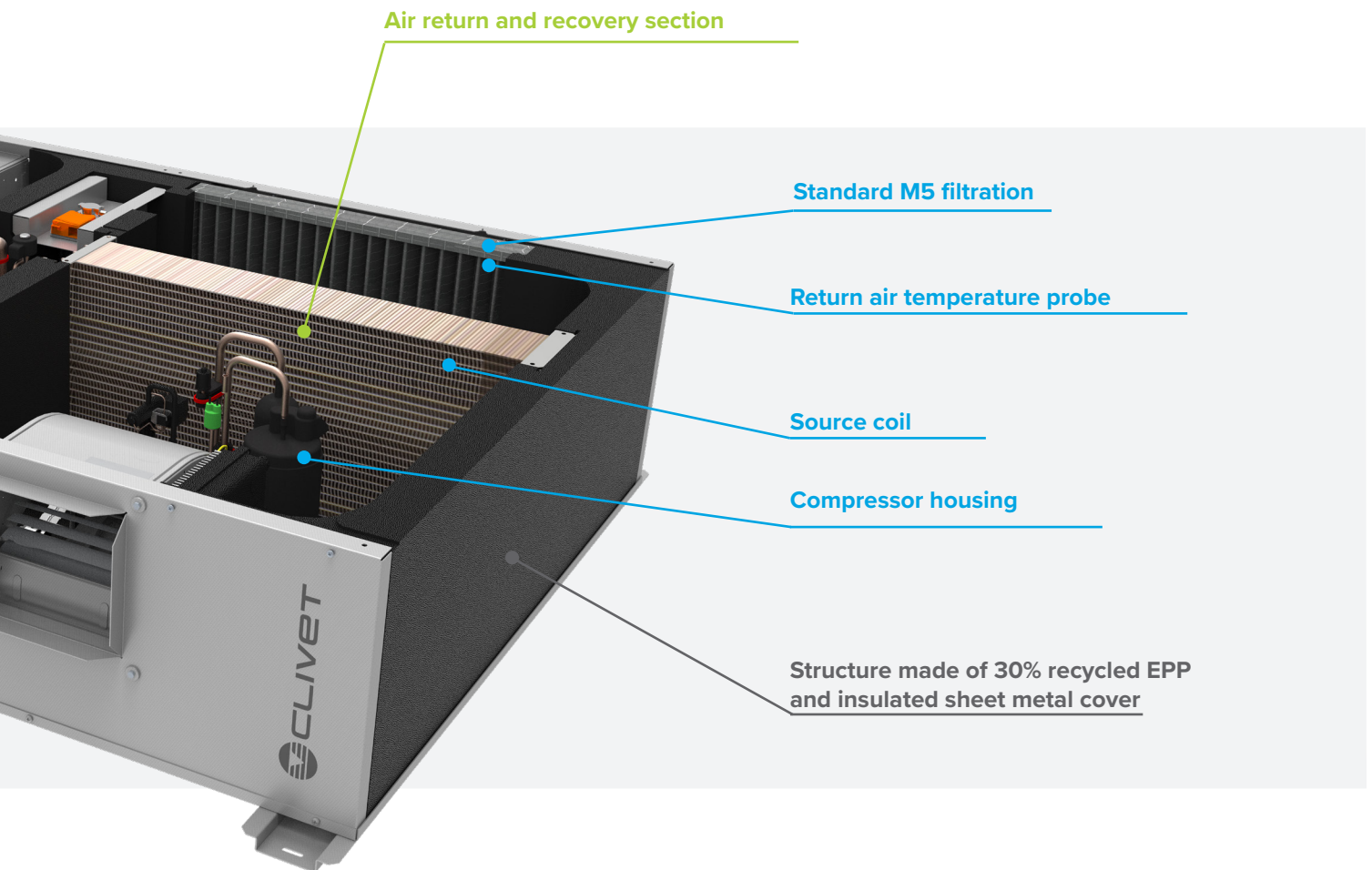
- ✓ Fully independent unit, with an extended winter operating range down to -20°C without the need for any auxiliary heat integration
- ✓ Lower height for perfect integration into false ceilings
- ✓ Reduced noise level
- ✓ Standard Modbus connectivity
- ✓ Integration into VRF control system (through CCM-270 A/WS and IMMPRO2) and Control4 NRG and INTELLIAIR supervision systems with remote management via the APP
- ✓ Suitable for both residential and light commercial applications
- ✓ Total fulfilment of fresh air load
- ✓ Contribution to the fulfilment of indoor loads. This
 - reduces activation of the main air conditioning system in existing buildings,
 - reduces the sizing of the main system for new builds.

Features

Active recovery

Full inverter thermodynamic circuit with low environmental impact

- ✓ Amplifies the energy in exhausted stale air by using it as a favourable source of heat, thereby increasing efficiency compared to traditional recovery solutions
- ✓ Transfers energy to the supply air continuously throughout the year and only as and when actually required, further increasing efficiency in partial load operation
- ✓ Comfort ensured all year round, thanks to continuous modulation of the inlet temperature



Clivet's choice towards a green evolution

- ✓ Reduction of the environmental impact by up to 90% through the use of R32 refrigerant with low GWP (675) and the careful design of every component.
- ✓ The unit can be installed indoors without any restriction or limitation. In fact, the refrigerant charge is below the limit for all sizes according to EN 60335 (1.84 kg of R32).

Industrial quality

- ✓ All components are designed for installation on the unit
- ✓ The units are tested and inspected by Clivet following strict quality standards
- ✓ The use of innovative materials, such as the lightweight EPP structure, makes it easier to handle and follow the installation procedures as well as achieve excellent acoustic and thermal insulation performance. The use of EPP with 30% recycled material reduces CO₂ emissions by 16%.

Operating principle

Fresh air

Extracts stale air from the indoor environment and supplies fresh air taken directly from outside.

Purification

The energy in the exhaust air is recovered and amplified through the refrigerant circuit and then transferred to the fresh air flow. The energy is recovered without contamination between the exhaust air flow and the supply air flow.

Unit thermoregulation is carried out by the temperature probe installed as standard in the return section on the unit.

Based on the difference between the return temperature measured and the setpoint set, the temperature controller independently and continuously modulates the refrigerant circuit in order to:

- condition the air supplied, helping to achieve the setpoint,
- supply the air at a neutral temperature if the setpoint is already achieved.

To reduce discomfort for people and avoid excessively high temperature differences between the outlet air from the terminals in the room and the temperature in the served rooms, the units are standard equipped with a supply limit temperature probe, which works in both cooling and heating modes.



Humidity control

During summer operation, a specific humidity control of the treated supply air is available. Through the probe installed in the supply section, the unit helps to control the indoor humidity. The supply temperature is in any case controlled by the limit probe.

CAUTION in this mode, to enable effective dehumidification, the supply temperature limit is reduced. Thus, the supply air could reach 12°C.

Automatic management of the air flow-rate

Constant: just the amount required

The nominal air flow-rate is set on the display

- Simplified system calibration and testing
- Constant flow-rate, by adjusting the fan speed
- Automatic compensation of the constant clogging of air filters
- For all diffusion systems that do not support variations in flow-rate, as in the majority of induction systems.

Variable: only the amount required

The air flow-rate can be modulated automatically via:

the CO₂ probe on the unit:

- Correct amount of air based on actual crowded areas
- Further energy saving in air flow
- Also available for other pollutants such as tobacco smoke, formaldehyde, cooking odours (VOC, Volatile Organic Compounds).

the external signal:

- Ideal for applications with independent rooms served by a single unit, such as classrooms with different occupancy levels
- Additional energy saving, ensuring high air quality only where and when needed.



Silent Mode

To reduce the noise, Silent mode and Supersilent mode can be set via the external signal or wired controller. These work by reducing the rotation speed of the fans and reducing the maximum frequency that the compressor can reach.

Features

Unit management

User interface (HMI)

The user interface is standard supplied with the unit and can be installed in the served room up to 50 m away with the power supplied directly by the unit; alternatively, it can be installed up to 300 m away and provided with a separate 12V DC power supply (provided by the Customer).

Some of its main functions:

- daily, weekly programming of unit switch-on or switch-off;
- manual or automatic change of the operating mode (heat, cool and ventilation) and/or set-point;
- display of unit alarms and statuses;
- management of operating parameters;

Connection of the user interface with 3 x 0.75 mm² shielded cable for communication, 2 x 1 mm² cable for the power supply if required.



INTELLIAIR CLIVET



Connectivity

Fresh Large EVO can be easily integrated into supervision systems that use Modbus as a communication protocol, thus providing access to the full list of operating variables, commands and alarms.

The serial connection is provided by the circuit board on the unit and the user interface, both of which are available as standard. They can be used either on their own or simultaneously, e.g. if there is a double supervision system.

In the latter configuration, priority is given to the last supervisor in terms of time acting on the parameters.



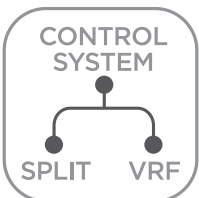
Integration in VRF systems

The control via VRF platform allows the following functions:

- unit switch-on/switch-off,
- set point management
- hourly/daily/weekly scheduling
- automatic / ventilation only operating mode
- cumulative alarm signal

The CCM-270A/WS centralized control can manage six lines of communication each with up to eight units, for a total of 48 systems (for either a total of 48 Fresh Large EVO units or 48 VRF systems to which up to 64 indoor units are connected).

The total length of each individual serial line must not exceed 1000 m (to be connected by the Customer).



The control system through IMMPRO2 software allows to manage a large number of VRF systems via PC. For additional informations refer to the specific documentation.

Integrated wifi for connection to the dedicated APP

The keypad has an intelligent control system based on a built-in module, which receives the signal from the APP.

The main functions that can be managed with the APP are:

- on/off
- change summer/winter mode
- set ventilation only mode
- set silent mode
- set the desired temperature

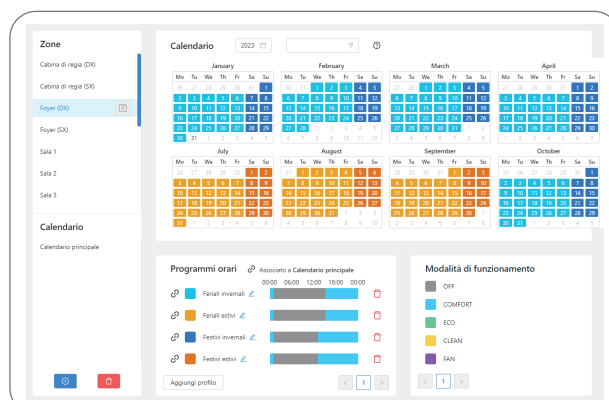
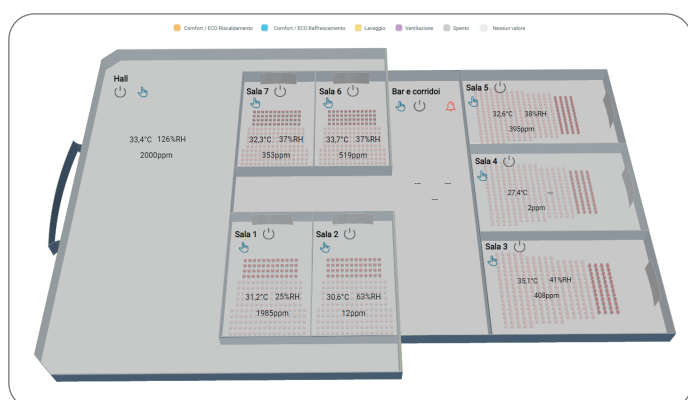
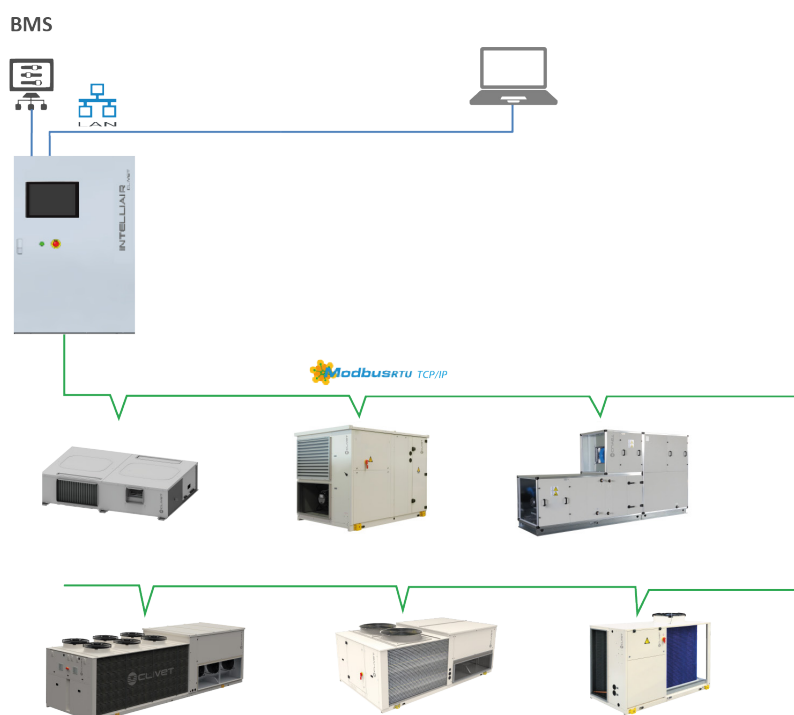
Advanced system management: INTELLIAIR

INTELLIAIR 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.

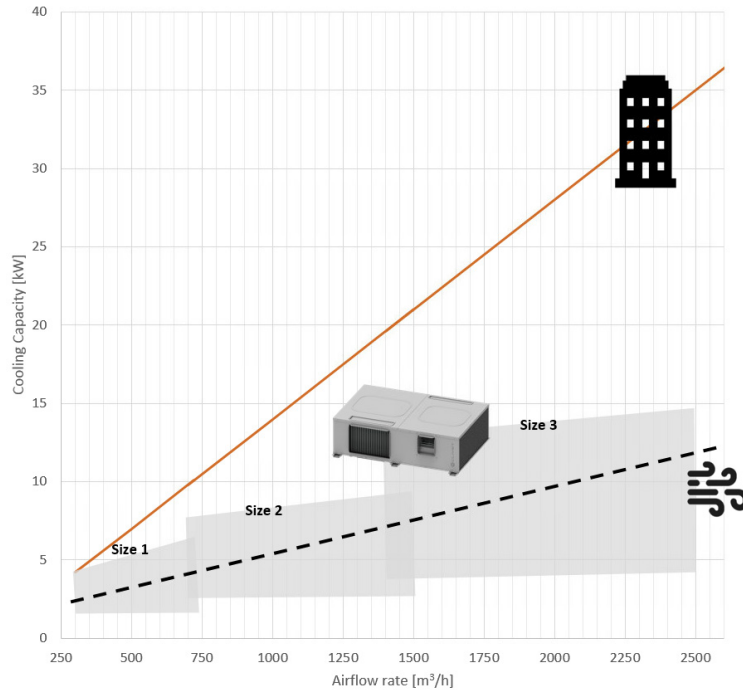
Unit configuration

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.

The unit is therefore able to completely cover the ventilation load throughout the year, while also contributing to the fulfilment of room loads including under design conditions..



Summer conditions: room air 27°C D.B./19°C W.B., outdoor air 35°C D.B./24°C W.B

— = Total Refrigerant Load of the building

- - - = Ventilation Load

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 trap 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.

Supply section	filtration stage (standard)	ISO 16890 ePM10 65%	M5
	filtration stage (alternative)	ISO 16890 ePM1 60%	F7B
Exhaust section	filtration stage (standard)	ISO 16890 ePM10 65%	M5

Compressor

Inverter-controlled rotary hermetic compressor fitted with a motor protection device for overheating, overcurrents and excessive temperatures of the supply gas. It is installed on rubber antivibration mounts and is complete with oil charge.

Structure

Supporting structure made with zinc-magnesium sheet metal that ensures excellent mechanical features and high long-term resistance against corrosion

Secondary structure in expanded polypropylene (60g/l density) which gives the unit excellent thermal insulation, air tightness and lightness during installation and maintenance.

The type of expanded polypropylene used contains 30% material recycled from EPP post-consumer waste, resulting in a 16% reduction in CO₂ emissions compared to a traditional expanded polypropylene.

Internal exchanger

Finned coil exchanger made from copper pipes arranged in staggered rows and mechanically expanded to better adhere to the fin collar. The fins are made from aluminium with a special corrugated surface, appropriately distanced to ensure the maximum heat exchange efficiency.

External exchanger

Finned coil exchanger made from copper pipes arranged in staggered rows and mechanically expanded to better adhere to the fin collar. The fins are made from aluminium with a special corrugated surface, appropriately distanced to ensure the maximum heat exchange efficiency.

Fresh air bypass damper

Damper that draws air from the outdoor return air and takes it upstream of the exhaust coil. The damper, via an on-off actuator, is opened in summer operation, with the compressor running and the exhaust fan at a higher speed step than the supply, so as to increase the airflow to the condensing coil: this increases the cooling efficiency without depressurising the room.

Fan

Brushless centrifugal supply and exhaust fan with high energy efficiency with double suction directly coupled to an electronically commutated EC electric motor.

The electronic control of the motor allows the flow-rate to be kept constant up to the maximum available pressure stated for each of the 5 flow-rates settable on the keypad.

Refrigeration circuit

Refrigerant circuit complete with:

- refrigerant charge
- high pressure safety pressure switch
- low pressure safety pressure switch
- 4-way cycle reversing valve
- electronic expansion valve
- liquid receiver

Filtration

Folded filter on outdoor air return and room return.
Folded air filter media in synthetic fibre, heat-pleated.
ISO EN16890 ePM10 65% efficiency
The filter can be completely incinerated.

Drain pan

Drain pan in thermoformed ABS directly housed in the expanded polypropylene mold.
The drain pan has a condensation drain pump and safety float.

Electrical panel

Electrical panel located inside the unit and easily accessible from the sides via the removable panels.

The control section consists of a microprocessor-controlled board that allows the unit to be controlled according to different air inlet conditions.

The control section includes:

- ambient temperature probe
- supply air temperature probe
- supply air humidity probe
- room return air temperature probe
- Modbus RTU connection
- dry contacts for remote ON-OFF, cumulative alarm, summer/winter mode, fan only mode, silent mode;
- double airflow set point management
- remote keypad for the user

Local room control allows you to:

- control only one Fresh Large EVO unit
- set the desired temperature
- set the desired air flow rate
- power it on/off
- change from Summer/Winter
- set ventilation only mode
- set Automode operating mode
- set the dehumidification function (Low / Standard / ECO)
- set the silent function (Silent / Super silent)
- manage diagnostics with a specific code for the type of error
- Modbus RTU connection
- Integrated wifi for connection to the dedicated APP

Dimensions: 120X120X20 mm

The thermostat is connected to the unit by a shielded cable, 5x0.75mm² cable+shield (cables for energy, signal and command transmission, shielded) at a maximum distance of 50m.

The cable must be installed chased or in a protected conduit, so that it is impossible for the end user to access it.

Test

Unit built to ISO 9001 quality standards and subjected to functional testing at the end of the production line

General technical data

Performances

SIZE			SIZE1	SIZE2	SIZE3
Nominal conditions					
Nominal Airflow		m ³ /h	500	1000	2000
Cooling					
Cooling capacity	1	kW	1,9	3,6	7,4
Sensible capacity	1	kW	1,9	3,6	7,2
Compressor power input	1	kW	0,2	0,6	1,0
EER_C	1	-	8,43	5,76	7,83
Cooling capacity (EN 14511-2022)	2	kW	1,9	3,5	7,1
EER (EN 14511-2022)	2	-	6,83	4,49	4,17
Heating					
Heating capacity	1	kW	2,3	4,5	9,3
Compressor power input	1	kW	0,3	0,7	1,3
COP_C	1	-	6,94	6,60	7,12
Heating capacity (EN 14511-2022)	2	kW	2,3	4,6	9,6
COP (EN 14511-2022)	2	-	6,09	5,42	4,68

Performance in cooling mode: room air 27°C D.B./19°C W.B., air entering the outdoor exchanger 35°C D.B./24°C W.B.

Performance in heating mode: room air 20°C D.B./12°C W.B., air entering the outdoor exchanger 7°C D.B./6°C W.B.

1. Supply air temperature 24°C in cooling mode and 20°C in heating mode
2. Data calculated in accordance with EN 14511-2022, with reference to an available pressure of 50 Pa

SIZE			SIZE1	SIZE2	SIZE3
Ventilation Load neutralisation and contribution to room air conditioning					
Nominal Airflow		m ³ /h	500	1000	2000
Cooling					
Cooling capacity	1	kW	4,4	8,3	15,0
Sensible capacity	1	kW	3,1	6,0	10,9
Compressor power input	1	kW	1,3	2,8	3,3
EER_C	1	-	3,30	2,90	4,50
Additional sensible capacity available in the room	1	kW	1,8	3,3	5,5
Heating					
Heating capacity	1	kW	3,9	7,8	15,6
Compressor power input	1	kW	1,0	1,9	4,8
COP_C	1	-	3,90	4,00	3,30
Additional available capacity in the room	1	kW	1,7	3,4	6,9

Performance in cooling mode: room air 27°C D.B./19°C W.B., air entering the outdoor exchanger 35°C D.B./24°C W.B.

Performance in heating mode: room air 20°C D.B./12°C W.B., air entering the outdoor exchanger 7°C D.B./6°C W.B.

Working point attainable during independent thermoregulation of the unit

1. Specific supply humidity 11 g/kg in cooling mode and Supply air temperature 30°C in heating mode

SIZE			SIZE1	SIZE2	SIZE3
Fan					
Nominal Airflow		m ³ /h	500	1000	2000
Supply fan consumption	1	W	35	93	396
Exhaust fan consumption	2	W	36	94	405
SFP (Specific Fan Power)		W/(m ³ /s)	511	673	1442

Contains fluorinated greenhouse gases (GWP 675)

1. Available static supply pressure 50 Pa
2. Available static exhaust pressure 50 Pa

Construction

SIZE			SIZE 1	SIZE 2	SIZE 3
Compressor					
Refrigerant				R32	
Type of compressors	1	-		ROT	
N° compressors		Nr	1	1	1
Refrigeration circuits		Nr	1	1	1
Control capacity		%	10-100%	10-100%	10-100%
Refrigerant charge	2	kg	0,6	0,8	1,7
Air Handling Section Fans (Supply)					
Type of supply fan/motor	3	-	CFG/EC	CFG/EC	CFG/EC
No. of supply fans		Nr	1	1	1
Nominal supply airflow		m³/h	500	1000	2000
Minimum supply airflow		m³/h	300	700	1400
Maximum supply airflow		m³/h	720	1500	2500
Installed unit power		kW	0,17	1,0	1,0
Max. static pressure supply fan	4	Pa	250	425	300
Fans (Exhaust)					
Type of fans/motor	3	-	CFG/EC	CFG/EC	CFG/EC
Number of fans		Nr	1	1	1
Installed unit power		kW	0,17	1,0	1,0
Maximum exhaust static pressure	4	Pa	215	390	230
Connections					
Condensate drain		mm	32	32	32
Power supply					
Standard power supply		V	230/1~/50	230/1~/50	230/1~/50

1. ROT = Rotary compressor SCROLL= scroll compressor
2. Indicative values for standard units with possible +/-10% variation. The actual data are indicated on the label of the unit
3. CFG = centrifugal fan- EC = Electronically Commutated
4. Net pressure available at nominal flow-rate

Electrical data

SIZE			SIZE 1	SIZE 2	SIZE 3
F.L.A. - Full load current at max admissible conditions					
F.L.A. Total		[A]	5,8	15,3	24,5
F.L.I. - Full load power input at max admissible conditions					
F.L.I. Total		[kW]	0,9	3,3	5,3

Data refer to standard units. Power supply: 230/1~/50 Hz. Voltage variation: max. +/-10%
Voltage unbalance between phases: max 2 %

Pressure drops of optional components

The available ducted pressure value is obtained by subtracting the pressure drops of any accessories from the maximum available net pressure (see general technical data table).

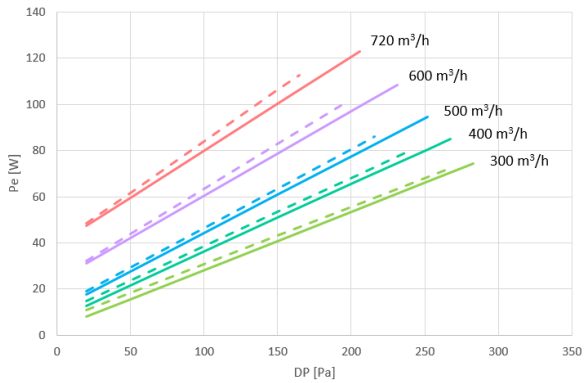
SIZE			SIZE1	SIZE2	SIZE3
F7B - F7 high efficiency air filter (ISO 16890 ePM1 60%)	1	Pa	32	59	65
FG3CX - G3 duct pre-filtration (ISO 16890 Coarse 40%)	1	Pa	14	31	34

1. Pressure drops with filters with average dirtiness

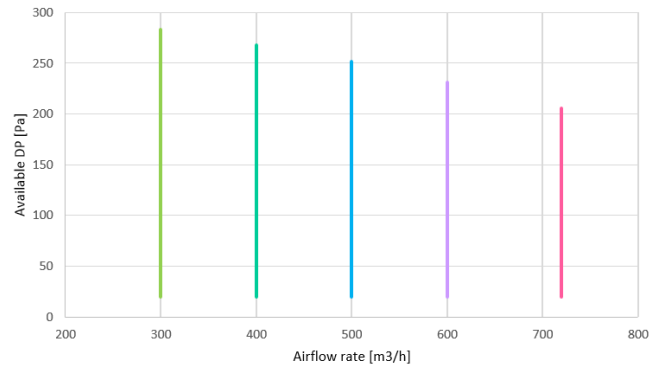
Fan performances

SIZE 1

Fans power input

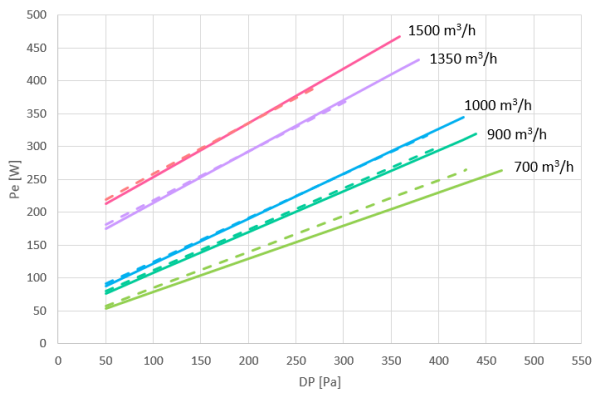


Fan available static pressure

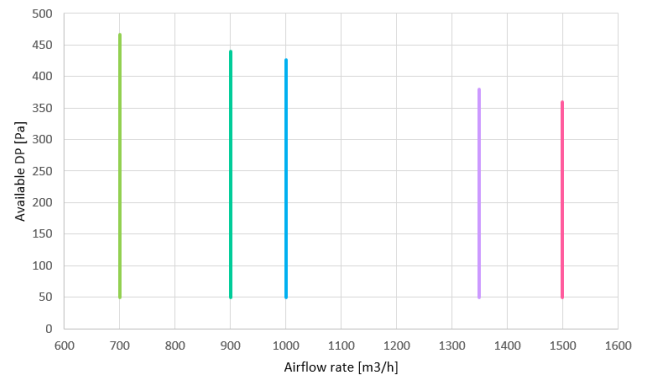


SIZE 2

Fans power input

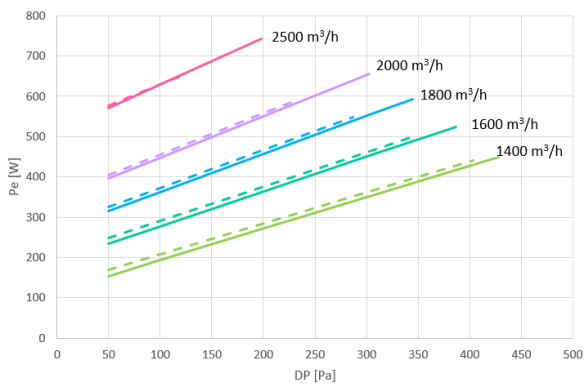


Fan available static pressure

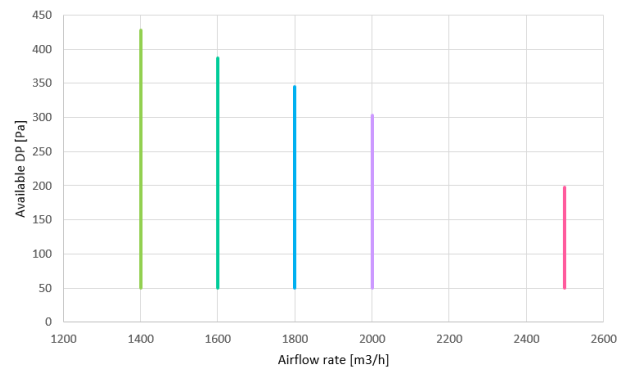


SIZE 3

Fans power input



Fan available static pressure



- ⚠ The performance takes into account the pressure drops inside the unit (treatment coil pressure drops, standard filters, etc.).
- ⚠ To determine the required performance of the fans, the pressure drops of any accessories must be added to the desired available static pressure.

— DP = Available static pressure
 — Pe = Supply fan power input
 - - - Pe = Exhaust fan power input

Nominal Flow-Rate

Sound levels – Nominal operation

SIZE	Sound Power Level								Sound power level dB(A)	Sound pressure level (1 m) dB(A)	Supply sound power level dB(A)	Return sound power level dB(A)
	Octave band (Hz)											
	63	125	250	500	1000	2000	4000	8000				
SIZE1	40	44	47	53	57	56	50	40	62	50	59	56
SIZE2	14	33	44	56	63	58	54	44	65	53	64	62
SIZE3	18	40	52	63	68	66	63	55	72	60	76	74

Silent sound levels

SIZE	Sound Power Level								Sound power level dB(A)	Sound pressure level (1 m) dB(A)
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000		
SIZE1	40	42	45	51	55	54	48	38	60	48
SIZE2	13	31	42	54	61	56	52	42	63	51
SIZE3	16	38	50	61	66	64	61	53	70	58

Supersilent sound levels

SIZE	Sound Power Level								Sound power level dB(A)	Sound pressure level (1 m) dB(A)
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000		
SIZE1	38	40	43	49	53	52	46	36	58	46
SIZE2	13	28	39	51	58	53	49	39	60	48
SIZE3	11	31	43	54	59	57	54	46	63	51

Sound levels refer to a unit with nominal load installed in a false ceiling and ducted. Available static pressure 50 Pa

The average sound pressure level, in accordance with UNI-EN ISO 3744, refers to a distance of 1 m from the outer surface of a ducted unit installed in a false ceiling

Power measurements are taken in accordance with UNI EN ISO 9614-1, with a ducted unit installed near a reflective surface, with a tolerance of 2 dB(A) on the measured sound power level.

The SILENT and SUPER SILENT operating modes (selectable via keypad or dry contact) limit the compressor and fan speed in order to reduce the noise level

If the unit is installed under conditions other than the nominal test conditions (e.g., near walls or obstacles in general), sound levels may vary significantly

General technical data

Minimum Flow-Rate

Sound levels – Nominal operation

SIZE	Sound Power Level								Sound power level	Sound pressure level (1 m)
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
SIZE1	38	40	43	49	53	52	46	36	58	46
SIZE2	13	29	40	52	59	54	50	40	60	48
SIZE3	11	31	43	54	59	57	54	46	63	51

Maximum Flow-Rate

Sound levels – Nominal operation

SIZE	Sound Power Level								Sound power level	Sound pressure level (1 m)
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
SIZE1	46	51	54	60	64	63	57	48	68	56
SIZE2	20	42	54	65	70	68	65	57	74	62
SIZE3	21	43	55	66	71	69	66	58	75	63

Sound levels refer to a unit with nominal load installed in a false ceiling and ducted. Available static pressure 50 Pa

The average sound pressure level, in accordance with UNI-EN ISO 3744, refers to a distance of 1 m from the outer surface of a ducted unit installed in a false ceiling

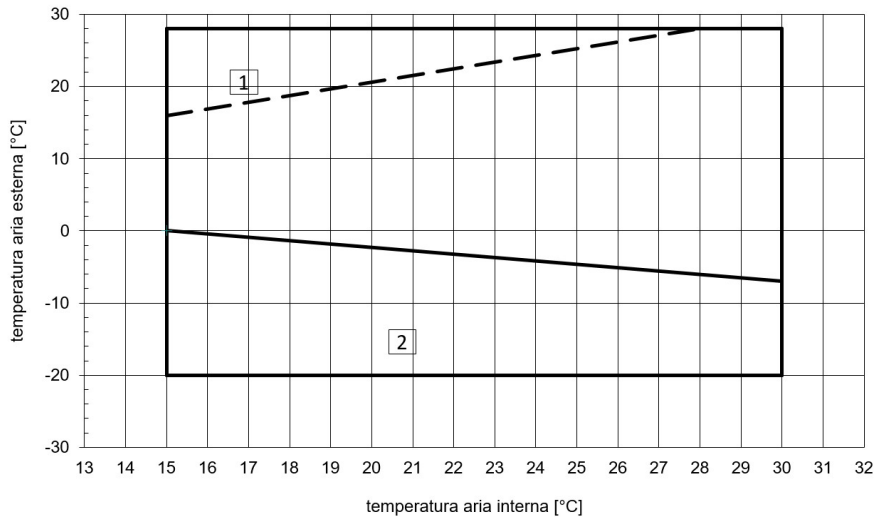
Power measurements are taken in accordance with UNI EN ISO 9614-1, with a ducted unit installed near a reflective surface, with a tolerance of 2 dB(A) on the measured sound power level.

The SILENT and SUPER SILENT operating modes (selectable via keypad or dry contact) limit the compressor and fan speed in order to reduce the noise level

If the unit is installed under conditions other than the nominal test conditions (e.g., near walls or obstacles in general), sound levels may vary significantly

Operating range

Heating



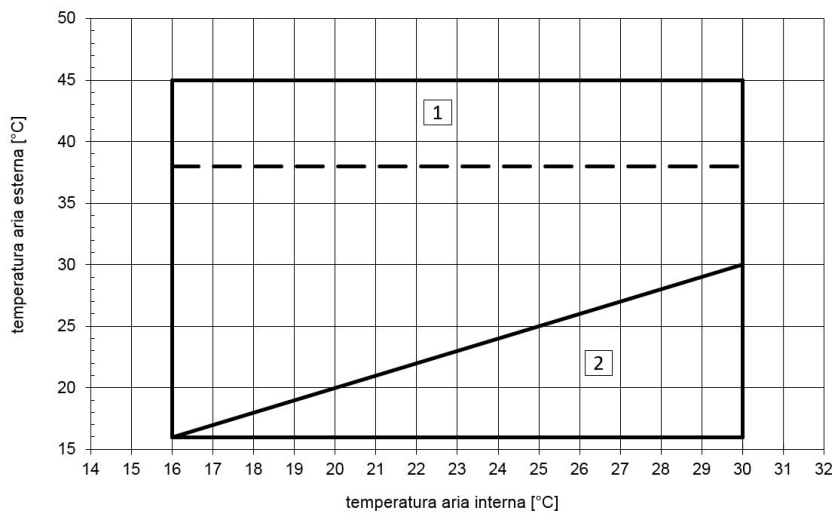
The limits are meant as an indication and they have been calculated by considering:

- nominal airflow
- clean exchangers and filters
- unrestricted positioning of the unit and its correct use
- return air relative humidity > 50%

1. Possible FREE-HEATING operation area
2. Operating range with possible modulation of the supply airflow, in which defrosting cycles could occur

The unit can work in airflow modulation to stay within the operating range

Cooling



The limits are meant as an indication and they have been calculated by considering:

- nominal airflow
- clean exchangers and filters
- unrestricted positioning of the unit and its correct use

1. Operating range with outdoor relative humidity < 40%
2. Possible FREE-COOLING operation area


The unit can work in airflow modulation to stay within the operating range

Option compatibility

Option compatibility

NAME	DESCRIPTION	COMPATIBILITY
VERSION		
RTA	Active thermodynamic recovery	√
FC	Thermal FREE-COOLING	√
REFRIGERANT CIRCUIT		
RCM	Refrigerant circuit with capacity modulation	√
EVE	Electronic expansion valve	√
AEREAULIC CIRCUIT		
PCOSME	Constant supply and exhaust airflow	√
PVARC	Variable supply and exhaust air flow with CO ₂ probe	0
PVARCV	Variable supply and exhaust air flow with CO ₂ +VOC probe	0
PPAQC	External CO ₂ signal management	0
FM5S	M5 outdoor air filter (ISO 16890 ePM10 65%)	√
FM5R	M5 return air filter (ISO 16890 ePM10 65%)	√
F7B	F7 high efficiency air filter (ISO 16890 ePM1 60%)	0
FG3CX	G3 duct pre-filtration (ISO 16890 Coarse 40%)	◇
ELECTRIC CIRCUIT		
CMSC9	Serial communication module for Modbus supervisor	√
CRC	Remote control with user interface	√
CTEM	Ambient temperature control with probes on board the unit	√
IOTX	IoT industrial module for cloud based interoperability & services	◇
CUE1	External humidifier control with ON-OFF control	0
MEAX	Energy consumption meter	◇
INSTALLATION		
II	Indoor installation	√
ASOFX	Kit of antivibration mounts for ceiling installation	◇
APAVX	Kit of antivibration mounts for floor installation	◇
HYDRAULIC CIRCUIT		
CDP	Condensation drain pump, installed on the unit	√
CLS	Condensate level sensor	√

- √ Standard component
- 0 Optional component
- ◇ PE optional component

-
- FC** **Thermal FREE-COOLING**
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.
Thermoregulation compares the temperature of the outdoor environment and the environment served by defining whether the fresh air supply alone is enough to ensure the temperature set-point while keeping the compressors off.
-
- CTEM** **Ambient temperature control with probes on board the unit**
Thermoregulation is carried out on the basis of the temperature conditions of the return air flow and the outdoor air flow measured by the probes installed on the unit.
-
- PCOSME** **Constant supply and exhaust airflow**
Thanks to the use of fans with EC technology, the continuous modulation of the fan speed ensures the set air flow-rate, which remains constant when the pressure drops in the distribution system and the filter clogging varies, keeping the air distribution inside the rooms unchanged.
Management of a second flow-rate set point via external signal is also available.
-
- CMSC9** **Serial communication module for Modbus supervisor**
Enables serial connection to supervision systems, using Modbus RTU with RS485 serial port as a communication protocol. Provides access to the full list of operating variables, commands and alarms. With this accessory, each unit can communicate with the main supervision systems.
-  The total length of each individual serial line must not exceed 1000 metres and the line must be connected in supervision bus (in/out). There are 2 serial ports available, one on the unit and one on the user interface. Both can be used simultaneously: the unit reacts to the last command received.
-

-
- F7B** **F7 high efficiency air filter (ISO 16890 ePM1 60%)**
Class F7 ePM1 60% (ISO 16890) multi-dihedral rigid pocket filters are filtration components for a more effective filtration. They are widely used in civil air conditioning systems and industrial applications requiring adequate efficiency against fine dust and particles larger than 1 µm. Class F7 filters are made of folded glass fibre paper with constant calibrated spacing, mounted on frames made of sturdy extruded molded polyester; the large filtering surface keeps the air side pressure drops low. Class F7 filters must be replaced after reaching clogging limits with scheduled periodic maintenance.
- ⚠ This option determines a reduction in the available static head (air side).
 - ⚠ To ensure high long-lasting filtration efficiency and increase the lifecycle of the filter, a suitable pre-filtration device for the outdoor air must be fitted. Device to be installed in duct outside the unit.
-
- FG3CX** **G3 duct pre-filtration (ISO 16890 Coarse 40%)**
With this kit, coarse particles in the outdoor air entering the unit are filtered with ISO 16890 Coarse 40% efficiency. This way, the high efficiency filtration systems on the unit are safeguarded, thereby ensuring long-lasting high filtration efficiency and increasing the lifecycle of the filter.
They can be installed directly in the fresh air intake section, or alternatively along the fresh air intake duct.
The filters must be replaced after reaching clogging limits with scheduled periodic maintenance.
-
- PVARC** **Variable supply and exhaust air flow with CO₂**
PVARCV **Variable supply and exhaust air flow with CO₂ + VOC probe**
Option suitable for rooms with highly variable crowded areas, automatically adjusts the air flow-rate to the actual conditions of use and increases ventilation savings. Complete with probe and integrated control logic. If the concentration of CO₂ (CO₂ + VOC) is higher than the set-point, the air flow-rate is increased according to the distance from the set-point. The probe is installed and wired on the unit and is located in the return section of the unit.
- ⚠ The adjustment is made between the selected supply airflow value and the maximum airflow value available for the specific size.
 - ⚠ VOC = volatile organic compounds. These compounds originate in environments with tobacco smoke, formaldehyde (coming for example from solvents, deodorants, glues, paints, detergents), cooking odours, etc.
 - ⚠ These solutions are not compatible with the PPAQC option (External CO₂ signal management)
-
- PPAQC** **External CO₂ signal management**
The unit is configured with a 0-5V input available for the proportional control of the amount of fresh air according to a signal from a CO₂ detection system to be taken care of by the customer.
- ⚠ This solution is not compatible with the PVARC e PVARCV options (Variable flow for supply and exhaust air with CO₂ /CO₂ + VOC probe)
-
- CUE1** **External humidifier control with ON-OFF control**
The option allows a humidifier outside the unit to be controlled by a dedicated On/Off signal.
Activation is managed by the unit temperature controller through the specific humidity control in the return section. The set point can be set either on the HMI interface or on the supervisor.
- ⚠ Humidifier supply, power supply and installation to be provided by the customer.
-

IOTX

IoT industrial module for cloud based interoperability & services

This device allows the monitoring and the remote control the unit via Clivet Eye, the supervision cloud system for Clivet units.

With IoT module (i-LINK) it will be possible to monitor and manage the unit through the mobile app Clivet Eye and the dedicated web page.

Among the main functions, for all monitored units they allow to:

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

Web interface at www.cliveteye.com.

Clivet Eye app available in Google Play and Apple Store



- ⚠ 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.

ASOFX APAVX

Kit of antivibration mounts for ceiling installation

Kit of antivibration mounts for floor installation

The unit can be fitted with rubber antivibration mounts for ceiling (ASOFX) or floor (APAVX) installation

MEAX

Energy consumption meter

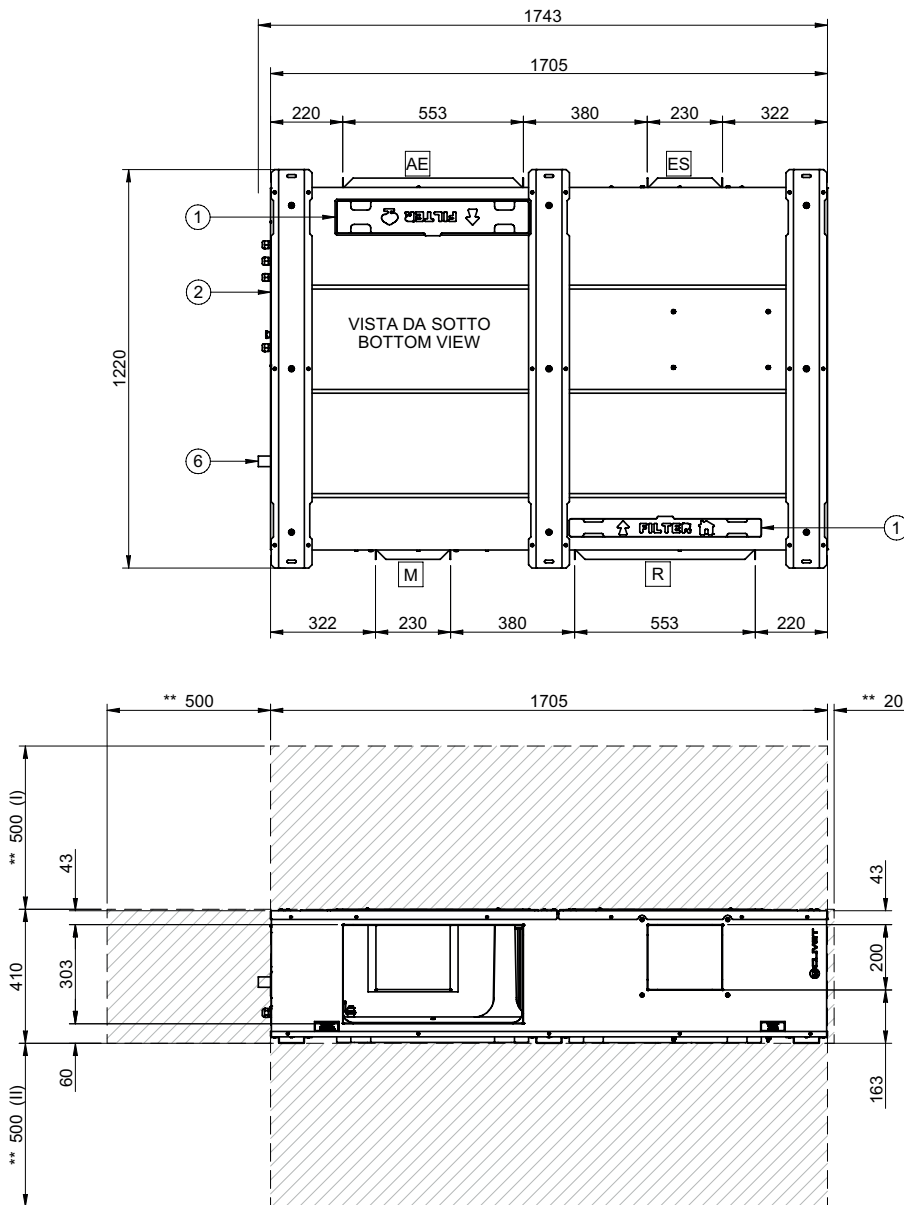
Allows to display and record the unit's main electrical parameters.

The data provided by the instrument can be read directly on the device or through the supervision system with a Modbus communication protocol. The device can be integrated into the INTELLIAIR supervision system. The following parameters can be displayed:

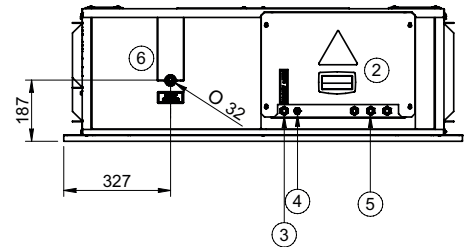
- voltage (V),
- absorbed current (A),
- frequency (Hz),
- phase shifting $\cos \varphi$
- power input (kW),
- absorbed energy (kWh),
- harmonic components (%)

- ⚠ Power supply, installation and possible connection to the supervision system to be provided by the customer.
- ⚠ This device is an accurate meter with CE certification; not suitable for legal metrology findings.

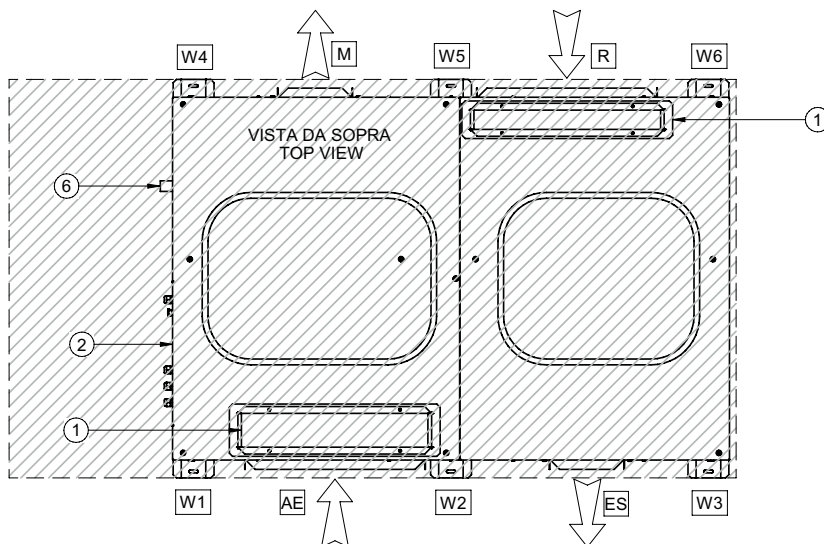
Size 2



(I) To be considered if the filter is extracted from the top



(II) To be considered if the filter is extracted from the bottom



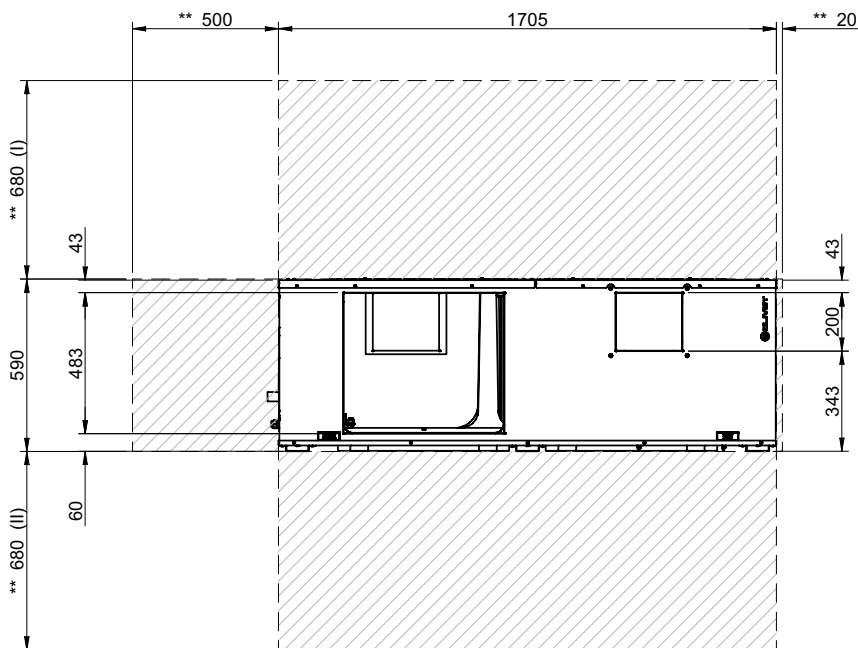
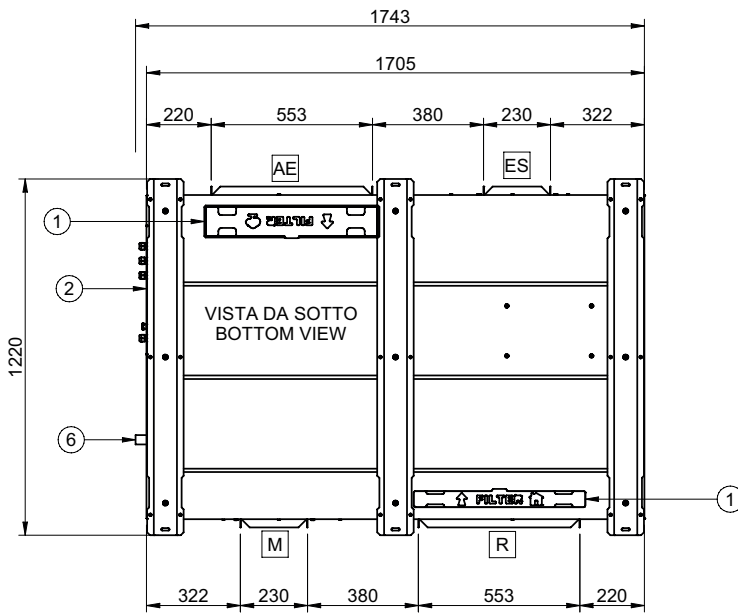
WEIGHT DISTRIBUTION

SIZE	SIZE 2	
W1 - W2 - W4 - W5	kg	20
W3 - W6	kg	23
Operating weight	kg	126
Shipping weight	kg	153

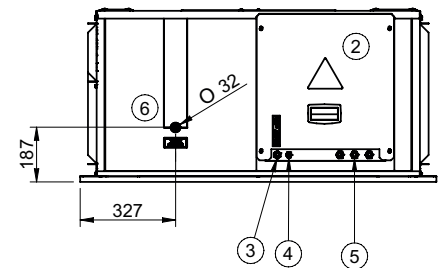
1. Removable panel for access to the air filter
 2. Electrical panel
 3. Power input
 4. Keyboard connection
 5. Auxiliary connection
 6. Condensate drain connection
- W1-W2-W3-W4-W5-W6 = Hanging brackets
 AE = outdoor air
 ES = Exhaust air
 M = Supply air
 R = Return air
 ** Minimum service clearance

Dimensional drawings

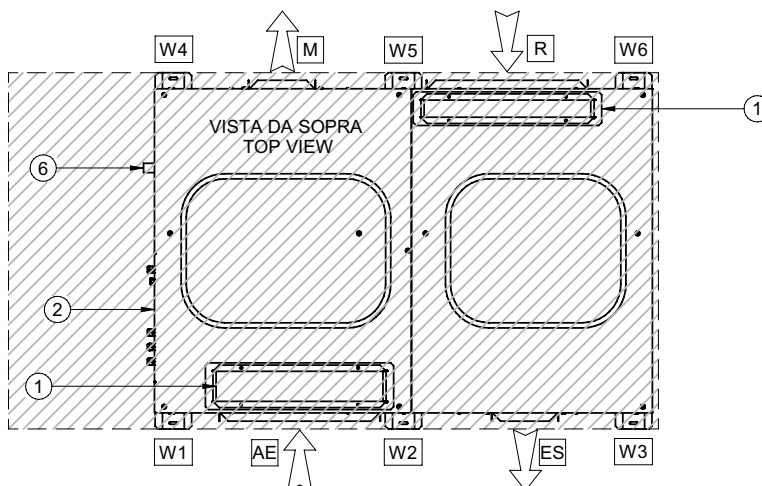
Size 3



(I) To be considered if the filter is extracted from the top



(II) To be considered if the filter is extracted from the bottom



WEIGHT DISTRIBUTION

SIZE	SIZE 3	
W1 - W2 - W4 - W5	kg	22
W3 - W6	kg	25
Operating weight	kg	138
Shipping weight	kg	165

1. Removable panel for access to the air filter
2. Electrical panel
3. Power input
4. Keyboard connection
5. Auxiliary connection
6. Condensate drain connection

W1-W2-W3-W4-W5-W6 = Hanging brackets

AE = outdoor air

ES = Exhaust air

M = Supply air

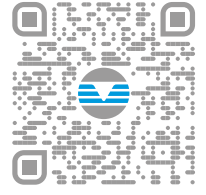
R = Return air

** Minimum service clearance

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