

Evio

Air cooled rooftop packaged unit

Application guide



REDGE participates in the ECP programme for RT.
Check ongoing validity of certificate :
www.eurovent-certification.com

3	GENERAL DESCRIPTION
3	APPLICATION
4	CONFORMITE UE
5	SAFETY CLASS R32
5	SAFETY DEVICES TO AVOID RISK OF FIRE
5	BENEFITS OF R32
5	CO2E : CARBON DIOXIDE EQUIVALENT
6	LEAK TEST FREQUENCY
6	INCREASED SAVINGS WITH AN ENVIRONMENTALLY FRIENDLY SOLUTION
7	KEY FEATURES
7	NOMENCLATURE
7	KEY FEATURES
7	ECO-DESIGN 2021
8	CASING
8	DESIGN
9	MODULARITY CONCEPT
10	REFRIGERENT CIRCUIT
11	FAN
12	CONTROL
13	CONSTRUCTION, INSTALATION AND SERVICE
14	INDOOR QUALITY
15	FRESH AIR AND FREE COOLING
16	OPTIONS DESCRIPTION
16	AIRFLOW CONFIGURATIONS AND ROOFCURBS
17	EXTRACTION AND EXHAUST OPTIONS
18	AUXILIARY HEATING OPTIONS
19	HEAT RECOVERY OPTIONS
20	FILTRATION OPTIONS
20	FRESH AIR OPTIONS
21	REFRIGERATION OPTIONS
21	ANTICOROSION PROTECTION
22	ELECTRICAL OPTIONS
23	CONTROL OPTIONS
23	COMMUNICATION OPTIONS
24	E-SAVVY
28	REDGE CLOUD
33	GENERAL DATA
33	RANGE
34	AIR COOLED TABLE
38	REFRIGERATION DRAWINGS
39	DIMENSIONAL DATA



- Product designed and manufactured under :
- Quality management system: ISO 9001
 - Environmental management system: ISO 14001.
 - Occupational health and safety management systems : OHSAS 18001



www.eurovent-certification.com*
www.certiflash.com



Our company's products comply with European standards*

All the technical and technological information contained in this manual, including any drawing and technical descriptions provided by us, remain the property of Redge and must not be utilised (except in the operation of this product), reproduced, issued to or made available to third parties without the prior written agreement of Redge. The specifications and technical characteristics in this booklet are given for information purposes. The manufacturer reserves the right to modify them without prior notice or obligation to modify in a similar manner, the equipments previously supplied.

* For out of EEC countries, non CE marked, and non EUROVENT certified units are available on request, please consult us.

APPLICATION



FAST FOOD / RESTAURANTS

In a dining setting, guest comfort is critical to an enjoyable experience. But hard-working staff need to be taken care of as well. Redge solutions provide reliable, efficient cooling and heating configurations that help create the perfect environment for food preparation and dining.



FOOD RETAIL

In large, open spaces, priorities for HVAC performance include both comfort and efficiency. With Redge one doesn't have to come at the cost of the other, with products and technology that deliver ideal heating and cooling solutions tailor-made for spacious retail settings.



STORAGE & LOGISTICS

A key success metric in distribution applications is keeping employees productive when fulfilling orders. Redge products and technology have been engineered to maintain comfort without compromising efficiency to deliver a win/win for staff and facility owners.



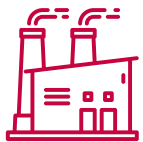
NON-FOOD RETAIL

In large, open spaces, priorities for HVAC performance include both comfort and efficiency. With Redge one doesn't have to come at the cost of the other, with products and technology that deliver ideal heating and cooling solutions tailor-made for spacious retail settings.



SHOPPING MALLS

A pleasant store environment means longer visit times and potentially increased sales. Redge customized products and controls offer retail spaces the most effective heating and cooling options, regardless of their size or configuration.



INDUSTRY COMFORT

In large, open industrial spaces, keeping the set temperature constant across the entire building is of utmost importance. Redge solutions offer industrial spaces accurate temperature, regardless of the activity or time.

EU CONFORMITY

The company hereby declares, under its own responsibility, that roof top (pressure equipment constituting the assembly), which are containing refrigerating fluids classified in group 1 (R32):

1. **Is in compliance with the requirements of « Under pressure equipments » directive, 2014/68/EU :**
 - Evaluation Module: H
 - 0094/PED/MAD/0950393/A ENG (*)
 - (*) This certificate transfers LRV Ltd (UK NoBo 0038) certificate No 0038/PED/FQA 0950393/A issued on 26 March 2020 which is now under the responsibility of EU Notified Body No 0094 (LRE)

2. **Are in compliance with the requirements of :**
 - EN378-2016;
 - EN60204-1;
 - EN 61000-6-1/2/3/4

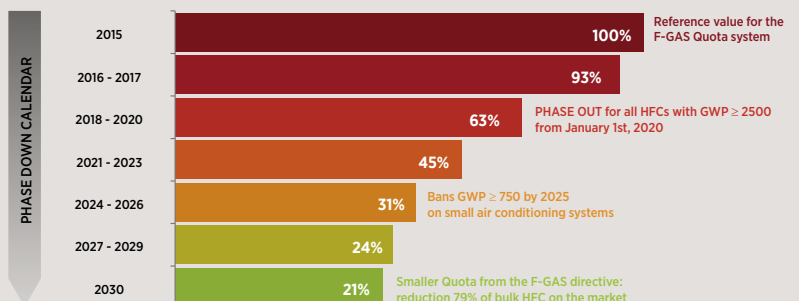
3. **The declaration is in conformity with the relevant Union harmonisation legislation.**

4. **Are in compliance with the requirements of :**
 - UE 517/2014 « F-gas », on fluorinated green-house gases.
 - CE 1005/2009 2009 on substances that deplete the ozone layer
 - CE 1907/2006 REACH

5. **Are in compliance with the requirements of :**
 - 2006/42/CE « Machinery » (Directive 2014/35/EU relating to low voltages taken into account in the machinery directive according to Annex 1 §1.5.1)
 - 2014/30/UE « EMC »
 - 2014/53/UE « Radio equipment»(if CLOUD option)
 - 2011/65/UE (2015/863/UE) « RoHS »
 - 2012/19/UE « WEEE »
 - 2009/125/CE « Ecodesign »
 - 2016/426/UE « Gas machines »

F-GAS DIRECTIVE RELATED TO THE EU REGULATION NO. 517/2014

It entered in force in January 2015, to contribute to the reduction of the global warming by limiting the use of HFCs. High GWP refrigerants may have a speculative price increase after each quota, due to the reduced availability of bulk HFC on the market.



SAFETY CLASS: R32

A2L refrigerants have a low burning velocity and a low heat of combustion. These characteristics makes them hard to ignite and eliminates the risk of an explosion.

The European standard EN378 classifies R32 as an A2 refrigerant, while ASHRAE Standard 34 classifies it as an A2L. Both regulations define R32 as a mildly flammable gas. However, it is unlikely to start the fire, as a large amount of refrigerant is required to sustain combustion.

A2L EVIO R32	B2L	LOWER FLAMMABILITY
A2	B2	LOWER FLAMMABILITY
A3	B3	HIGHER FLAMMABILITY
HIGHER TOXICITY	HIGHER TOXICITY	

SAFETY DEVICES TO AVOID RISK OF FIRE

LEAK DETECTOR

Optical leak detector installed on the indoor coil that identifies any leakage. It triggers at 50% of the LEL (Lower Explosive Limit).

- Standard feature
- Easy maintenance and calibration
- No building adaptation required
- Factory mounted sensors
- IP65 certified
- High accurate detection

LEAK DETECTOR

When a leak is detected, the system turns off after a pump down procedure, with the entire refrigerant charge stored on the outdoor coil.

Both indoor and outdoor fans remains active, and increase their speed to provide maximum air flow, helping the dilution of the leaked refrigerant.

Conformity to EN 378-1:2016 and IEC335-2-40:2018.

BENEFITS OF R32

Low charge refrigerant:

- Up to 30% charge reduction on the total thermodynamic circuit

Single component substance:

- No glide
- Easy to handle and recover

Availability:

- Largely applied on the residential market
- Low price and easy to source
- Unlicensed refrigerant

ASHRAE safety group: A2L

Composition:

- 100% Difluoromethane (HFC)
- Pfas-free refrigerant

CO2e : CARBON DIOXIDE EQUIVALENT

CO2e indicates the amount of CO2 which would have the equivalent global warming impact of any refrigerant.

To limit the use of high GWP refrigerants, many countries have set taxes to be applied on the sale those substances.

The tax is usually proportional to the CO2e and to the amount of fluorinated refrigerant used on the system (HFCs).

$$\frac{\text{CO2e} = \text{Refrigerant charge (kg)} \times \text{GWP}}{1000}$$

SPANISH FARES
R32 : 10Euro /Kg CO2

LEAK TEST FREQUENCY

According to F-Gas, the amount of CO₂e of the total refrigerant charge on a circuit will define how often a leakage test will be required.

A leak test usually takes a technician half day of work on the job site and may cost around 450€/test¹.

Considering the same units from the previous example, the e-Baltic can offer 50% of savings on the leak test costs along the unit lifespan.

CO ₂ e	F-GAS LEAK CHECKING FREQUENCY	
	With no leak detection equipment fitted	With leak detection equipment fitted
CO ₂ e ≤ 5	None	None
5 < CO ₂ e ≤ 50	once every 12 months	once every 24 months ³
50 < CO ₂ e ≤ 500	once every 6 months ²	once every 12 months
CO ₂ e ≥ 500	once every 3 months	once every 6 months

INCREASED SAVINGS WITH AN ENVIRONMENTALLY FRIENDLY SOLUTION

LOW ENERGY CONSUMPTION

35% energy savings with Evio when compared to a standard rooftop installed on a retail building.

Innovative solutions for long lasting energy savings:

- Direct transmission variable speed ventilation system
- Advanced refrigeration system with multiscroll R32 compressor assemblies, electronic expansion valves, extended heat exchange surface area, alternate and dynamic defrost cycles.
- Fresh air and free cooling management.
- Optimized operation with eClimatic.

BETTER RECYCLING MANAGEMENT

- Unit assembled in an ISO14001 certified facility.
- Refrigerant R32 to reduce GWP / refrigerant charge.
- Reduced material usage with compact packaged design.

REDUCED MAINTENANCE COSTS

- Fully factory tested plug and play packaged system.
- Direct transmission plug-fan with low maintenance and airflow measurement.
- eClimatic communicating and programmable controller.
- Connectivity for visualization of performances thanks to RedgeCloud.
- Smart building management (BMS) thanks to e-savvy.

NOMENCLATURE

Ev_(A) **125**_(B) **A**_(C) **H**_(D) **055**_(E) **S**_(F) **P**_(G) **F**_(H) **1**_(I)

- (A) **Ev** = Evio
- (B) **B** = Maximum air flow (x 100 m³/h)
- (C) **A** = Air cooled
- (D) **H** = Heat pump
- (E) Commercial Cooling capacity in kW
- (F) **S** = 1 circuit - **D** = 2 circuits
- (G) **P** = R32
- (H) **F** = Scroll
- (I) **1** = Revision

KEY FEATURES

- Flexibility in capacity and airflow rates, ventilation options, energy sources and design (configurations and roof curbs) to best fit your application's needs.
- Optimized design and integration of highly efficient components, allowing significant energy savings.
- Low noise level thanks to several sound attenuation options available.
- Installation and replacement made easy thanks to the unit's compactness, same footprint and weight than other models.



ECODESIGN 2021



HIGHLY EFFICIENCY COMPRESSORS

Tandem scroll compressors allowing capacity modulation.



NEW EC FAN-MOTOR GENERATION

Variable speed EC axial fans with swept blades for improved efficiency.



NEW REFRIGERANT: R32

Better efficiency with a low GWP solution.



NEW HEAT EXCHANGER

Improved heat transfer efficiency thanks to new tubes geometry and new fin design.



HEAT RECOVERY

Thermodynamic heat recovery, heat recovery wheel, plate recovery and water and CO2 coil recovery systems.

CASING

Evio is an air-to-air heat pump air conditioner, driven by an electric compressor, of which the evaporator, compressor and condenser are integrated into a single package.

It is built as a single package unit assembled in factory on a common single frame

It is a direct expansion system, the outdoor side heat exchanger (condenser / evaporator) allows heat transfer with 100% ambient air.

DESIGN

Evio is a one-piece modular outdoor unit on chassis, consisting of an air handling section and a refrigeration section.

The air treatment section is built with sandwich panel B-s3,d0 (external panel precoated steel painted in RAL 9003 color, internal panel aluminum and 48mm of injected PU foam), supply and return air from below, mixing box with fresh air grille included. The unit is specially designed for corrosion resistance and to ensure long operation lifetime.

Condensing section mounted in a rigid base frame to ensure good support for compressors and giving rigidity to the complete structure, is designed for easy maintenance, with direct access to all components. The whole unit is plug and play, with a control system specially developed for Rooftop operation.



MODULARITY CONCEPT

Nowadays, buildings are taking advantage of the best technical construction, and the different improvements in isolation and lighting technologies contribute to decrease the cooling or heating demands.

Evio packaged units are fully adapted to this new trend and can offer different combinations of thermodynamic refrigerant circuits with the same indoor airflow, giving different cooling or heating capacities.

In this way, Evio units adapt perfectly to the building needs and save energy in those applications that do not have so high demands of cooling or heating.

Indoor section will satisfy the main ventilation requirements, while the different capacity platforms will cover the exact cooling or heating needs.

The combination of the indoor unit together with different thermodynamic platforms, allows Evio range to :

- Offer a stable air quality (humidity and CO2) and airflow.
- Respect ventilation and filtration standards.
- Adapt to the exact cooling and heating requirements of the building.
- Contribute to save energy.

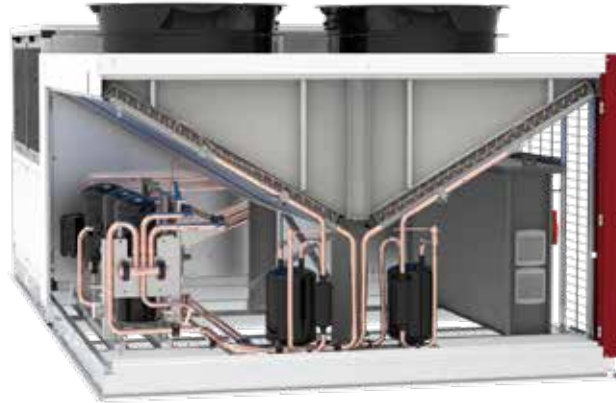


REFRIGERANT CIRCUIT

Evio presents the most advanced design in the refrigerant pipes, optimizing pipe length and at the same time giving the best access for service and maintenance operations.

The exchangers have been specially designed by Redge for R32 operation, this copper tube and aluminium fins exchangers have been tested to give the best heat transfer and the best energy ratios.

The refrigeration circuit is responsible for up to 40% of the annual energy consumption of a typical packaged air conditioning unit.



*

SAVING ENERGY WITH REFRIGERATION CIRCUIT DESIGN

R32 REFRIGERANT

Efficient systems such as Evio are designed around R32 refrigerant to achieve the best performances.

- New generation of heat exchanger optimized for R32.
- Environmentally friendly refrigerant:

R32 is PFAS free, it is a pure refrigerant without blend and no glide.

It contains No Chlorine (ODP =0). Significant refrigerant charge reduction (-30%) that limits the global warming potential of the system.

MULTISCROLL COMPRESSOR TECHNOLOGY

Evio units are provided with tandem compressors, to profit from the multiscroll compressor technology and giving the highest seasonal performance and the best SEER / SCOP coefficients.

HIGH EFFICIENCY MULTISCROLL TECHNOLOGY

Air conditioning equipment are sized to cover the need for the most critical weather conditions which most likely will occur only a few days or even a few hours during the year.

Most of the time, the external temperature drops below the reference value and consequently systems usually run 96% of the time at part load. It is therefore important to design system around part load performance to achieve the lowest possible annual energy consumption.

Evio provides high efficiency and best possible part load efficiencies year round with high efficiency multiscroll R32 compressor technology.

ELECTRONIC EXPANSION VALVES

The new electronic expansion valves with a removable head are directly driven by the eClimatic and optimize the performances in both cooling and heating mode and provide reliable and accurate operation in all conditions all year round.

This model of electronic expansion valves ensures also smooth and precise control at low capacities for improved part load performances.

FAN

EC MOTOR TECHNOLOGY IN SUPPLY

EC plug fan technology offers the maximum efficiency together with the minimum power consumption, equivalent to IE5 motor with variable speed.

That's why Evio provides EC fans in indoor section.

This will help to answer requirements for applications with high pressure drop in the ductworks (long or complex ductworks when the unit is located far from the target area).

The standard unit will be provide with composite blade with special features include a 3D bionic profile, a special twisted blade geometry and a V-shaped serrated rear edge.

These features, combined with the corrugated surface of the blades, create a diffuse sound radiation that reduces the fan's noise level to a minimum.

In option the unit will be provide with aluminum blade in order to offer more air flow, more pressure (it allow the unit to work in ERP application compliant with the French regulation).



The EC plug-fan technology allows:

- Adapting airflow at commissioning
- Varying airflow during unit operation providing progressive inflation of smooth /textile ductworks
- Easy maintenance operations, as there is no belt and pulley regulation

Profits about this EC technology by:

- Monitoring the airflow in the service terminal
- Compensating the airflow if the filters are dirty
- Regulating the airflow to arrive to the desired setpoint temperature
- Reducing the airflow to achieve the most adequate sound level.

EC MOTOR TECHNOLOGY IN EXTRACTION

EC plug fan technology offers the maximum efficiency together with the minimum power consumption, equivalent to IE5 motor with variable speed.

That's why Evio provides EC fans in exhaust section, aluminium fan blades as standard.

This will help to answer requirements for applications with high pressure drop in the ductworks.

The EC plug-fan technology allows:

- Adapting airflow at commissioning
- Easy maintenance operations, as there is no belt and pulley regulation

Profits about this EC technology by:

- Monitoring the airflow in the service terminal
- Compensating the airflow if the filters are dirty
- Regulating the airflow to arrive to the desired setpoint temperature
- Reducing the airflow to achieve the most adequate sound level.

EC MOTOR TECHNOLOGY IN CONDENSOR VENTILATION

EC axial technology offers the maximum efficiency together with the minimum power consumption, equivalent to IE5 motor with variable speed.

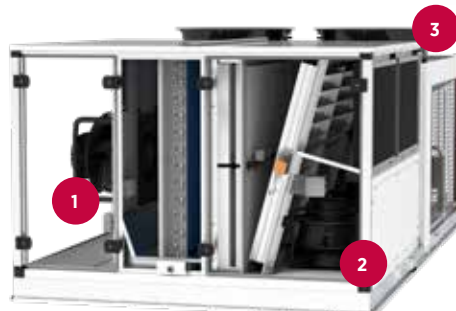
The variable speed motor is optimum with operating thermodynamic circuit and increase the seasonal efficiency

Profits about this EC technology by:

High Pressure - Low Pressure floating, optimum temperature and optimum condensing air flow with variable charge



1. Ventilation ventilation
2. Extraction ventilation
3. Condensing ventilation



CONTROL

eClimatic

Our Evio range includes our e-climatic control generation. The main features of this control are :

- Plastic cover to protect the circuit board from water entry and humidity and with all the different connection terminals correctly identified.
- Two independent buses, one for display and sensors connection and another one for internal components.
- Possibility of storing all parameterized conditions before an alarm is produced.
- Stronger hardware thanks to the plastic cover which protects the circuit board from water entry and humidity (and at the same time clearly identify all the different connection terminals)
- More reliable hardware thanks to the different communication buses for internal/main devices (compressors, fans, etc.) and for the remote/accessory ones (display, probes), which preserve the regular unit operation even in case of commissioning miss wirings
- Enhanced Climatic™ regulation thanks to the better embedded processor and to the new Universal I/O chip, which allows to match better contacts, probes and relays to the controller board.
- Internal memory to log variables (e.g temperatures) but also to store digital documentation (e.g. electrical diagrams, manuals).
- Web server included as a standard with the controleur



OPTIMIZED OPERATION AND SETUP SAVES ENERGY

eClimatic is designed to provide the best efficiency throughout unit's lifecycle while ensuring reliable and consistent operation with user-friendly interfaces. This controller monitors more machine parameters than ever to improve energy efficiency and reliability



1. Indoor air temperature (humidity and CO2 levels as an option)
2. Outdoor air temperature (outdoor humidity as an option)
3. Return and supply air temperature
4. Filter pressure drop
5. Airflow rate
6. Refrigerant pressures, temperatures & compressor monitoring
7. Power energy metering (option)

REFRIGERATION CIRCUIT EFFICIENCY MANAGEMENT

eClimatic control regulation

The eClimatic controls the blowing air temperature to achieve the customer comfort in the most efficient way, matching perfectly the cooling/heating load with the optimum unit capacity staging (multiscroll compressors, heat recovery modules, freecooling, gas burners, water coils, etc.).

The unit reliability is ensured by a complete set of protections as compressor envelop control, air-flow and pressure drops check, advanced refrigerant leakage detection, compressor anti short cycling rules.

All these features are designed to optimize the unit performance, but at the same time to increase its life-time and make easier its maintenance.

DYNAMIC DEFROST:

It is a standard feature of all Redge heat pumps. It limits in winter the number and the duration of the defrost cycles to maximize COP. With a smart and proprietary frost-detection system, the Redge rooftops automatically optimize the number and the duration of the defrost cycles to get the best units performances in every environmental conditions.

FREE COOLING:

It is one of the most important features of this rooftop as it maximize seasonal efficiency by reducing the use of thermodynamic cooling in mid-season.

INTELLIGENT FRESH AIR MANAGEMENT:

With accurate percentage of fresh air the dampers are regularly calibrated to introduce just the required amount of fresh air in the building to reduce annual energy consumption. The fresh air ratio can also be controlled using the indoor CO2 level as an input.

INTELLIGENT HEATING PRIORITY OPTIMIZATION:

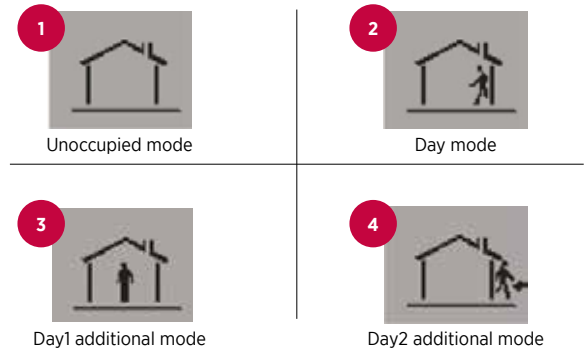
This unique feature on the market, allows the user to program the priority between the different heating elements (thermodynamic, electric pre-heaters or auxiliary heating). This is particularly interesting on dual fuel units or units with electrical pre-heaters. This feature maximizes energy efficiency by optimizing heat pump operation depending on the outdoor temperature.

FULL SCHEDULING

Impressive energy savings can be done with a proper time-scheduling that optimizes the unit operation to the different load scenarios of each installation.

For that reason the eClimatic offers a weekly-based + special days calendar with up to 6 time-bands per day and 5 pre-set modes (Unoccupied, Occupied, Stand-by- Bypass, Off).

For each of this pre-set modes, plenty of unit settings can be optimized to the different moments of the day, for example during the un-occupancy periods the comfort set-points could be relaxed, during the energy-cost peaks hours the hot water coils or gas burners could be preferred to compressor or electrical heaters, fresh-air introduction can be reduced to warm-up the building before customer arrival, etc.



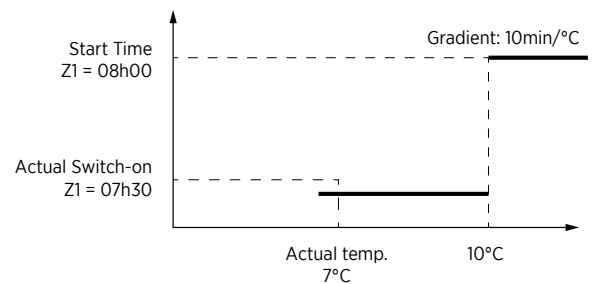
MORNING ANTICIPATION AND DYNAMIC SET POINT

The unit can be programmed to switch-on in the morning to reach the occupied zone temperature set point just in time.

The rooftop will start heating the building at a different time in the morning depending on the outdoor temperature: The lower the outdoor temperature, the earlier the rooftop would start to ensure that the set point is reached by the time the first occupied zone (Z1) is starting. This is to avoid early start when outdoor temperature is mild.

Example for a unit programmed to anticipate morning switch-on if outdoor temperature is below 10°C at a rate of 10 minutes/°C.

Dynamic set point can be used in summer to offset the ambient temperature set point according to the outdoor temperature. This is to avoid large temperature difference between indoor and outdoor. The indoor temperature set point would then increase with the outdoor temperature improving comfort and saving large amount of energy.



COMMUNICATION AND UNIT INTERLINK

Master/slave or cascade control is a standard feature of the Evio units. It can be used to connect up to 12 rooftops. The units can then be programmed to optimize efficiency and improve reliability following 6 different strategies:

MULTI ROOFTOPS REGULATION

In case of multi-rooftop installations, The Climatic control of each unit can improve the unit synergies and optimize the total air-conditioning performance, without any additional cost or external dedicated “Building Manager System”, but just linking the units together (up to 8) in the same network and applying any of the following smart strategies :

- 1: Master Slave “total”: The master gives the ventilation order, its set point and its room temperature/humidity/CO2 to all other rooftops.
- 2: Master Slave “temperature”: The master gives the ventilation order and its room temperature/humidity/CO2 to all other rooftops, but they have their own set point.
- 3: Master Slave “average”: The master gives the ventilation order and the room temperature/humidity/CO2 used by all rooftop is the average of all rooftop, each rooftop has its own set point.
- 4: Master Slave “cooling/heating”: All rooftop are stand-alone but the slaves have to have the same running mode as the master (Cooling or heating).
- 5: Master Slave “Back-up”: One rooftop is the back-up unit and will operate if any of the other rooftops is stopped due to a major problem.
- 6: Rolling Back-up mode: Same as above, except the “back-up” unit will change once a week on Tuesday.

Note that, the outside temperature/humidity/CO2 given to all rooftops can either be the average of all unit connected or the external humidity/temperature of the master, allowing the use of a single “weather station” for the whole site.

CONSTRUCTION, INSTALLATION AND SERVICE

UNIT CONSTRUCTION

Evio by Redge is assembled with the highest standards of quality.

This construction guarantees high corrosion resistance and lower the weight impact, also ensuring that the air leakages are reduced to the minimum. To improve the resistance to anticorrosion, the panels are pre-painted in RAL 9003.

TRANSPORT AND HANDLING

To facilitate handling of the unit and minimize the risk of damage, Evio units are provided with lifting lugs located in the base frame of the unit.

The sizes up to 100 kw (185AH95) can be loaded by forklift or by crane, above this size the loaded can be possible only by crane.

For transport and handling, the units are wrapped in a retractable plastic protection.

PLUG AND PLAY UNIT

All options are factory installed on the unit, which means that they are ready for use, optimizing the time spent on site for the installation. Bottom entry (through the base) for electrical power and hot water (if option fitted) lines are available as standard. To make installation easier, Evio power supply does not require "neutral" connection. It is powered by 400 V, 3 phases, 50 Hz, neutral system TT.

CIRCUIT BREAKERS

To improve safety and extend life time, circuit breakers protect against over-loading, over current and a disconnected supply phase. Maintenance is also improved as there is no requirement to change fuses.

NUMBERED WIRES

All wires and connectors are numbered as shown on the electrical drawing to facilitate maintenance and diagnostic

MAIN DISCONNECT SWITCH

The main switch is used as an emergency cut off.

It is mandatory to guarantee a proper accessibility to this switch. Specific footbridges must be installed if the machine environment is requiring it.

Main disconnect switch is lockable to increase safety around the rooftop unit. Switching off the unit with the disconnect switch will reset all.

Disconnect switch will be sized accordingly to the options picked with the unit.

EASY ACCESS TO THE UNIT COMPONENTS

In Evio we keep the accessibility of all the components to the indoor unit, as well as all the refrigerant components.

INDOOR AIR QUALITY

BUILDING AIR QUALITY

According to the EN 13779 the filtration level should be in accordance with the application and the environment.

The outdoor air is categorized in 3 levels, from ODA 1 where the air is pure except for temporary pollution such as pollen, up to ODA 3 with high concentrations of both gases and particles.

The indoor air is also categorized in 4 levels (IDA1 is not applicable for rooftop ranges).

For rooftop applications :

- IDA2: Offices, University, Retirement houses, Hotel lobbies, Museums, Pools
- IDA3: Commercial buildings, cinemas, Theatres, Restaurants, Bars, Sport halls...
- IDA4: Low Air Quality such as Industrial Buildings

Indoor air quality		
IDA 2	IDA 3	IDA 4
Medium	Moderate	Low
CO ₂ (ppm)		
400-600	600-1000	> 1000
Rate of outdoor air (m ³ /h/person) Non-smoking area		
36-54	22-36	< 22

Outdoor Air Quality	ODA1	ODA2	ODA3
	F8	M6/F8	F7/GF*/F9
	F7	M5/F7	M5/M6

*GS = Gas Filter

FILTERS EFFICIENCY CORRESPONDANCE

Standards correspondence EN779:2012/ISO16890.

FILTERS

The first stage will be with a 50mm rail and the second stage will be a 100 mm rail. Each filter stage will be equipped with a pressure transducer

Evio is fitted with G4 filters as standard and can offer higher levels of filtration as an option :

- ISO Coarse 80%+ ISO ePM10 50% (G4+M5)
- ISO Coarse 80%+ ISO ePM1 50% (G4+F7)
- ISO Coarse 80% + ISO ePM1 85% (G4+F9)
- ISO ePM10 50% + ISO ePM1 50% (M5+F7)
- ISO ePM10 50% + ISO ePM1 85% (M5+F9)

ANALOGIQUE FILTER DETECTION

Thanks to this sensor, the filter presence and the proper fan operation is ensured by a pressure drop above the minimum threshold, and at the same time the filter dirtiness is identified by a pressure drop above the maximum threshold one pressure sensor per filtration stage.

DOUBLE SKIN PANEL

Indoor unit of Evio may be provided by a double skin panel as standard, to avoid the carrying of insulation particles inside the building (48 mm of thickness of Polyurethane Foam - PU). The double skin panel is closed cell structure, water tight, cleanable, washable, airtight, high durability, ro-proof, fire certified B-S3,d0. Insulation thermal conductivity $\mu = 0.025$ W/mK.

REMOVABLE ALUMINIUM DRAIN PAN

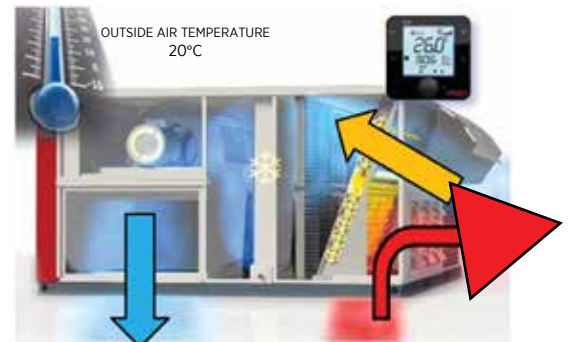
All units are equipped with a sloped removable drain pan in aluminum which can be removed for maintenance, preventing the growth of bacteria and algae in the drain pan. It is a lateral drainage, with a siphon supplied with the unit to be fitted on job site



FRESH AIR AND FREE COOLING SYSTEM

Freecooling system is a standard feature for all Redge rooftops, with a two sections damper made in aluminum, and connected with a proportional servomotor controlled by the eClimatic controller.

Managing fresh air is recommended in a building to control CO2 level and comfort. Fresh air management and Free Cooling are standard features of Evio that can reduce annual energy consumption.



SAVING ENERGY WITH FRESH AIR & FREE COOLING

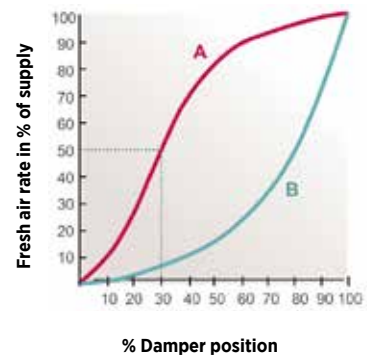
- Thermodynamic cooling can be replaced by Free Cooling when outdoor temperature is below the building set point saving up to 15% on annual energy consumption.
- Introducing just the required amount of Fresh Air in a building can reduce energy consumption.

Because a fresh air damper curve is not linear, it is not accurate to assume that the percentage of opening of the damper is equal to the percentage of fresh air entering the building. However, this **linear** control of a damper is by far the most used in the industry.

With Indoor air quality and running cost of a building being more important, Evio can manage the percentage of fresh air more accurately.

If the pressure drop in return air duct is high, the amount of fresh air actually introduced in the building can be higher than required. This extra fresh air will have to be cooled in summer and heated in winter, increasing energy consumption of the system.

Evio will periodically recalibrates fresh air dampers to ensure just the required amount of fresh air is introduced in the building. This recalibration is achieved using the return air, outdoor air and supply air sensors.

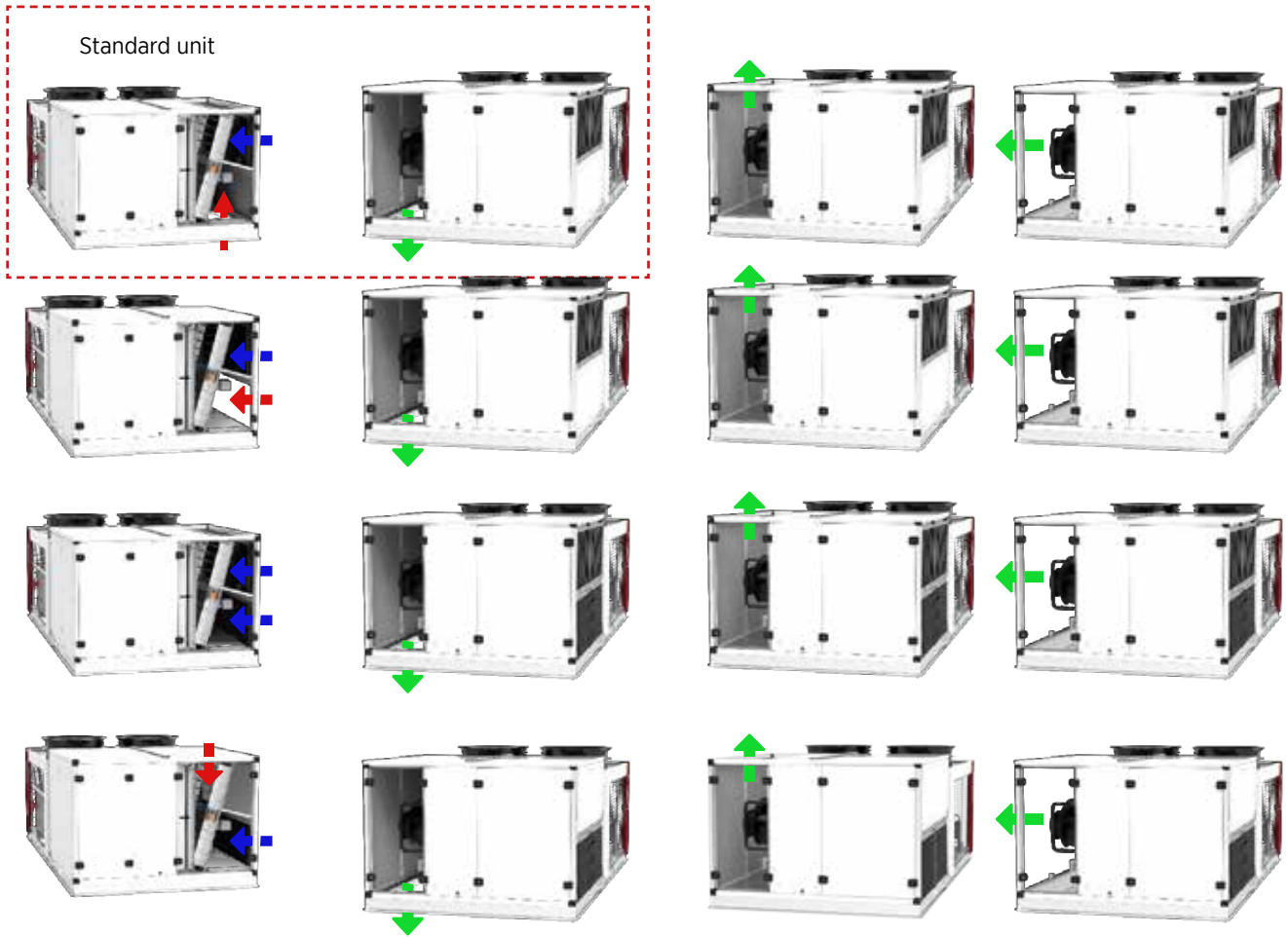


Curve A: ΔP return ducts > Fresh air: Too much fresh air
Curve B: ΔP return ducts < Fresh air: Not enough fresh air

AIRFLOW AND ROOFCURBS CONFIGURATIONS

BASIC BLOWING CONFIGURATIONS

Unless otherwise specified at the time of order, Evio rooftops are delivered in supply and return configuration from below. The airflow rate of the units can be adjusted at the factory to meet the needs of the building.



ROOFCURBS

ADJUSTABLE ROOFCURBS

This adjustable, assembled roofcurbs is made from 2.5 mm galvanised steel. This adjustable upstand is designed for installation on roofs with slopes of up to 4-5% in all directions, and allows Evio unit to be adapted to most roof profiles.

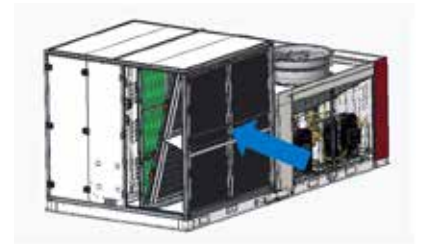
Downflow roofcurbs units are the simplest and most cost-effective way of installing packaged air-conditioning systems in single-volume buildings. This frame can be fixed directly to the roof structure thanks to its integrated adjustable flanges and waterproof cladding returns.

EXTRACTION OPTIONS

100% FRESH AIR

When system only work with fresh air, without mixing air with return air.

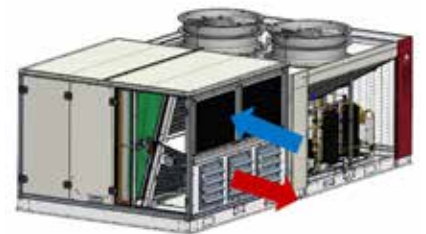
Building air tightness	High
Fresh air & Free cooling	100%
Pressure drop in the return ductwork	No duct
Building pressure control	Pressure balance possible



GRAVITY EXHAUST DAMPER

Gravity exhaust dampers are used to relief pressure when outside air is being introduced in a building with good air tightness

Building air tightness	Medium
Fresh air & Free cooling	High fresh air rate Free cooling
Pressure drop in the return ductwork	Low < 50 Pa
Building pressure control	Low control

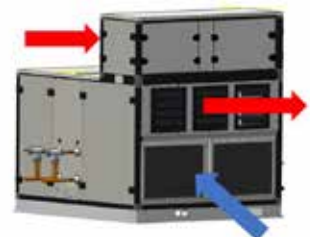
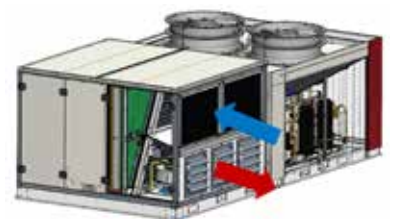


EXTRACTION FAN

Where system balancing is critical and return ductwork pressure drop is high, it is recommended to use extraction fan.

A plug fan installed with a 3rd damper

Building air tightness	High
Fresh air & Free-cooling	High fresh air rate Free-cooling
Pressure drop in the return ductwork	High > 150 Pa
Building pressure control	Pressure balance possible



AUXILIARY HEATING OPTIONS

WATER COILS

A water coil made of copper pipe and aluminum fins can be installed to answer heating and cooling requirements. This water coil can, for example, be connected to a boiler or a heat pump. Two sizes of pre heater water coils, three sizes of post heater water coils of water coils and one size water coil post cooling are proposed to cope with the cooling and heating requirements. The water coil is equipped with a 3-way valve.

The hot water coil are protected from freezing by the Climatic, through low environment protections based on low supply and external temperatures, which activates safety procedures like pump starts, valve opening or return air damper opening.



ELECTRIC HEATER

The auxiliary electric post-heater is made of shielded resistance heaters. The heater is protected against high temperature with a thermal overload protection set at 90°C.

For any rooftop unit size, two sizes of electric heater are available as option, L (Low) and H (High).

All the auxiliary electric heater are controlled by TRIAC modulating system.

The electric pre-heater is located before the main thermodynamic coil. This option is designed to authorize heat pump operation with low mixed air temperature.(low outdoor temperature with units running with a high fresh air rate in winter).

For any rooftop unit size, three sizes of electric pre heater are available as option, L (Low), M (Mediem) and H (High).

MODULATING CONDENSING GAS BURNER TECHNOLOGY:

This condensing gas burner is developed to reach condensing behavior, allowing both very high efficiency and high modulating ratios. Efficiency level reaches 108%. This gas burner has been designed to guarantee a level of NOx emissions < 30 ppm, no CO emissions.

This gas burner uses Venturi air/gas valve as an additional safety.

When there isn't air suction in the combustion chamber, there will be not gas intake on the chamber.

This gas burner includes a pre-installed gas pilot that allows safety start-up cycles independently from different gas supply conditions that may vary from country to country and also from one period to another.

It is possible to regulate the OFF-SET ratio in order to optimize combustion, although already fixed in factory assembly.

The combustion chamber and surfaces in contact with condensate condensate (tube bundle, fume collection hood) are made of AISI in AISI 441 to guarantee high resistance to condensate.

The system is completely pre-regulated and tested in the production line with high efficiency valves, safety devices and emission values certified on each single case.

If required, an expansion device can be provided with the unit allowing it to operate with gas pressures of up to 300 mbar.

Gas fired rooftop cannot be installed inside a technical room.

HEAT RECOVERY OPTIONS

ENERGY RECOVERY ON EXHAUST AIR (ENTHALPIC RECOVERY WHEEL)

To match Redge commitment to a greener planet and to generate energy savings, Evio by Redge can be equipped with one system to recover energy from the extraction air built around a EUROVENT certified wheel exchanger.

Ideal for climates in which the difference between the outdoor temperature and the extraction air temperature is high. This rotary wheel will generate very high sensible but also latent transfer.

Fresh air and return air are protected with G4 filter.

For any rooftop unit size, two sizes of recovery wheel are available as option, 50% fresh air and 100% fresh air. This option is designed with purge sector.



ENERGY RECOVERY ON EXHAUST AIR (PLATE EXCHANGER)

Built around a EUROVENT certified plate exchanger equipped with bypass damper on the fresh air, the heat recovery module is fully controlled by the eClimatic.

It has been designed to handle free-cooling (when heat recovery shouldn't apply) and the exchanger is protected against freezing of the exhaust air.

This module is fitted as a standard with G4 filters on the fresh air section.

This will protect the exchanger against outdoor dust and increase the global filtration capacity of the machine.

For any rooftop unit size up to 18500 m³/h, two sizes of plate heat exchanger are available as option, 50% fresh air and 100% fresh air.



WATER COIL RECOVERY : HEAT RECOVERY FROM EXTERNAL WATER SYSTEMS

It is the most advanced heat and cold transfer and recovery solution to recover free heat and cold produced by external water system (food refrigeration system, geothermal, boiler...).

Exemple:

50% of supermarket total annual energy consumption is used to cool chilled and frozen food in display cases and cold rooms. Most supermarket applications with food refrigeration systems reject thermal energy to the ambient environment through air cooled condensers.

- With eRecovery, free thermal energy is transferred to the sales area through a hot water coil located in the rooftop before the thermodynamic heating coil.
- eRecovery provides more than just preheating, as it is designed to cover up to 100% of the heating needs.
- It is also the most flexible heat recovery solution on the market as when heating demand is high, Evio can always supply additional thermodynamic and auxiliary heating.

As this heat recovery hot water coil is located just after the fresh air intake it is highly recommended to use glycol water in the circuit to prevent risks of freezing.

THERMODYNAMIC RECOVERY OF EXHAUST AIR

Active anytime in all temperature and air flow conditions of the Rooftop, in all seasons. No additional thermodynamic circuit, no additional compressor, no additional maintenance, for a low carbon footprint solution. This includes refrigerant leak detection sensor R32 to protect return air building.

FILTRATION OPTIONS

Evio offer several different levels of filtration that will allow coping with every application and any level of filtration demanded in the installation.

As standard the unit comes with G4 coarse 50% ePM10.

FILTERS EFFICIENCY CORRESPONDANCE

Standards correspondence EN779:2012 / ISO16890

EVIO OPTIONS:

- ISO Coarse 80% (G4 with 50 mm depth metallic frame)
- ISO Coarse 80% (G4 with 50 mm depth metallic frame with replaceable media)
- ISO ePM10 50% (M5 with 50mm depth metallic frame)
- ISO ePM1 50% (F7 with 100 mm depth)
- ISO ePM1 85% (F9 with 100 mm depth)

		ISO16890			
		ePM10	ePM1	ePM2,5	ePM10
EN779:2012	Class				
	G4		-	-	-
	M5	-	< 20%	< 40%	> 50%
	M6	-	< 40%	50 - 60%	> 60%
	F7	-	50 - 75%	> 70%	> 80%
	F8	-	70 - 85%	> 80%	> 90%
F9	-	> 85%	> 90%	> 95%	

- Not compliant to minimum 50% efficiency
- Compliant to minimum 50% efficiency
- Exceed the minimum efficiency
- Only ISO Coarse

FILTER CLOGGING MANAGEMENT

Each filtration stage is controlled by a pressure transducer ventilation system adapts to the pressure drop across the filters to maintain a constant flow rate.

With the new 100 mm ISO ePM1 50% (F7) or ISO ePM1 85% (F9) filter, the pressure drop is reduced by up to 50% compared to the previous 50 mm version. Lower pressure drop gives more available pressure for the customer and lower fan running costs. It also takes 4 times longer to get plugged with dirt reducing maintenance costs.



FRESH AIR OPTION

HUMIDITY CONTROL PACK

Where a higher level of controllability is required to make the Evio even more flexible, REDGE have compiled a pack that includes two advanced control features.

“ENTHALPY CONTROL ON ECONOMIZER”.

- The eClimatic and its humidity sensors (return air and fresh air) ensures that the economizer does not use 100% fresh air if the outside air has a higher enthalpy than the return air. This feature is relevant in regions where the relative humidity is high or when the desired room air condition is very dry.

“HUMIDITY CONTROL”

- The eClimatic and its humidity sensors, analyze dry and wet bulb temperatures to control dehumidification. Humidity control is only available if ambient temperature is in cooling or dead zone. The dehumidification algorithm can dry the air by passing it through the coil in cooling mode.
- A specific function in the program can be activated to control the minimum supply air temperature, by maintaining it equal to the heating set point, using auxiliary heaters (Electric, Hot water coil or gas burner).
- A proportional 0-10V contact is also available to control an external humidifier.

AIR QUALITY SENSOR (CO2)

Indoor air quality is controlled from the eClimatic main controller. A VOC (Volatile Organic Component) sensor detects the amount of CO2 in the ambient air between 0 and 2000PPM. (This obviously varies depending upon space occupancy levels). The VOC sensor sends a proportional signal (0-20mA) to the eClimatic controller which will then modulate the fresh air. The CO2 sensor is communicating through the internal bus of the unit.

REFRIGERATION OPTIONS

LOW NOISE OPTION

As rooftops are often installed in a noise sensitive area, REDGE proposes a low noise option on the Evio range. To achieve low noise level, Evio receives a quieter variable speed EC fan-motor with dedicated mode on controller, a compressor jacket.



REFRIGERANT LEAK DETECTION

To fulfill A2L regulation and risk analysis of public area, Evio unit will be equipped with optical refrigerant detector. Auto-secure unit equipped with optical refrigerant leak detectors. See Redge representative for periodic re-calibration.

The leak detection is fitted on the indoor coil, on the supply air, in order to protect the building and the people inside.

ANTICOROSION PROTECTION

When the units are installed in potentially aggressive environments, which can often be the case for example in coastal environments, it is often a requirement that the coils are specially treated to protect them against the corrosive effects.

ELECTRICAL OPTIONS

ENERGY METER

The Evio meter option is a device that measures and displays the following parameters :

- Average, total and maximum current, voltage and frequency for each phase.
- Active & reactive power.
- Power factor (Cosφ).
- Total active & reactive Evio consumption in Wh.

Values for energy, current and absorbed power can be reset with password.

Some of these data will be collected by the controller and made available in the BMS tables for Modbus, BACnet and Trend protocols.



THERMAL ENERGY METER

The Evio thermal energy meter device of the thermodynamic circuit (compliant with RITE / Spain) measures and displays the following parameters :

- A cooling energy meter (kWh)
- A heat energy meter (kWh).

If you combine the thermal energy meter and electrical energy meter option, the controller continuously calculates :

- Instantaneous thermal output (kW) :
- calculation of COP and EER efficiencies
- The power, COP, EER and energy values

Some of these data will be collected by the controller and made available in the BMS tables for Modbus, BACnet and trend protocols

3 PHASE CONTROL

This phase control device offers the guarantee of the correct phase connection, together with an overvoltage and under voltage protection.

FIRE DETECTOR

It is a thermostat that provides a signal to switch off the unit, close the fresh air damper and open the return damper when the temperature in the return air stream is above an adjustable set point (Factory setting: 70°C).

SMOKE DETECTOR

Located downstream of the filter, the optical head of the smoke detector can detect any type of smoke. When this occurs the unit will stop operating, the return air damper will be fully closed and the fresh air damper will fully open while sending an alarm signal to the unit.

In accordance with the European norm, it is also compliant with the French regulation on public buildings.



SOFT STARTER ON COMPRESSOR

Evio integrates the option with soft starter on the compressor in order to reduce the starting current, one soft starter is mandatory per each compressor, this device is integrated in the electrical box.

FOUR AMBIANT TEMPERATURE SENSORS PACK

The Evio four ambient temperature sensors provides an average temperature for a room with different temperatures (glazed surfaces, stratification, non-homogeneous air diffusion, etc.) for precise rooftop control.

CONTROL BY VARIABLE AIR FLOW BY CONSTANT PRESSURE

Evio constant pressure function controls the supply fans at variable speed.

This function is used in ""multi-zone"" applications to maintain a constant pressure in the supply duct at all times and to adapt to the customer's variable airflow requirements.

CONTROL OPTIONS

THERMOSTAT WITH WALL MOUNTED TEMPERATURE DISPLAY

This is a remote controller for non-technical customer. It is designed to fit aesthetically inside a room and be very easy to use. It has a 24V supply to be connected to the rooftop and can be installed at maximum 30 meters away from the unit.

The graphical display gives information such as running mode of the unit, status of the fan, set point, % of fresh air, outside air temperature.

Customer can set the temperature set point for a given time zone, switch the unit “On” or “Off” and adjust the clock. DC can display fault codes with a reset possibility, ambient, supply and outdoor temperature, fresh air damper position (%), time zone and operating mode pictogram, heating or cooling status.

It is also able to display supply fan airflow rate (0-33-66-100%) and component status for compressors, defrost, condenser fans and auxiliary heaters.

DC™ comfort display is equipped with a temperature sensor that can be used as room temperature sensor.



DIGITAL TOUCHSCREEN

This display gives access to more functionality than the DCTM and allows graphical visualization of the unit operation, temperatures and components status, the adjustment of main setpoints and scheduling.

It can connect to multiple units if they are connected to the same LAN.



DS SERVICE DISPLAY

This new plug and play service display and controller allows service personal to set up to read and modify main unit parameters (Unit settings, operating time and number of compressor starts, low and high pressure reading, airflow rate of supply fan, and read alarm history).

This controller has been designed to be very user friendly, with 6 different keys and graphic display. It includes scrolling menus and full text (no codes) explanation. It is available in English or another alternate language.



COMMUNICATION OPTIONS

COMMUNICATION INTERFACES AND SUPERVISION

MODBUS INTERFACE / MODBUS TCP IP

The eClimatic ModBus interface is required to connect the unit to a BMS using “Modbus Protocole”. No other hardware than this board is required to have ModBus communication. One board required per unit. The ModBud interface is available in two version to be connected with RS485 or TCP/IP

BACNET INTERFACE

The eClimatic BACnet interface is required to connect the unit to a BMS BACnet protocol. No other hardware than this board is required to have BACnet communication. One board required per unit. The BACnet interface is available in two version to be connected with RS485 or TCP/IP depending in the site requirement.

E-SAVVY : SMART BUILDING MANAGEMENT SYSTEM (BMS)

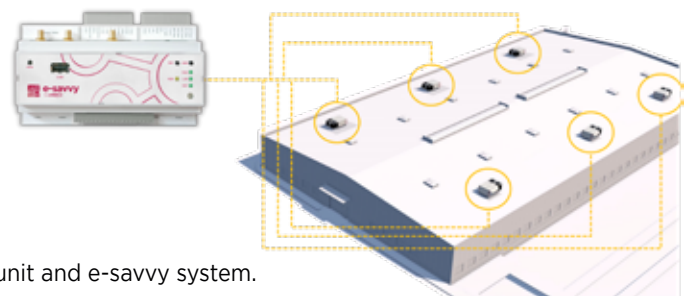
e-savvy is a single site and multi units Smart Building Management System

General Description

e-savvy is an innovative solution from Redge for the monitoring and management of HVAC systems. Thanks to its intuitive man machine interface, **e-savvy** allows you to monitor in real time the status of all the devices. The interactive system allows the modification of several parameters such as settings and schedules of each area and to follow the trends. **e-savvy** is a connected system able to send alerts in real time to its users. **e-savvy** is a simple, intuitive and user friendly tool allowing the zoning and the creation of several schedules in order to closely follow the needs of its end users.

Customer benefits

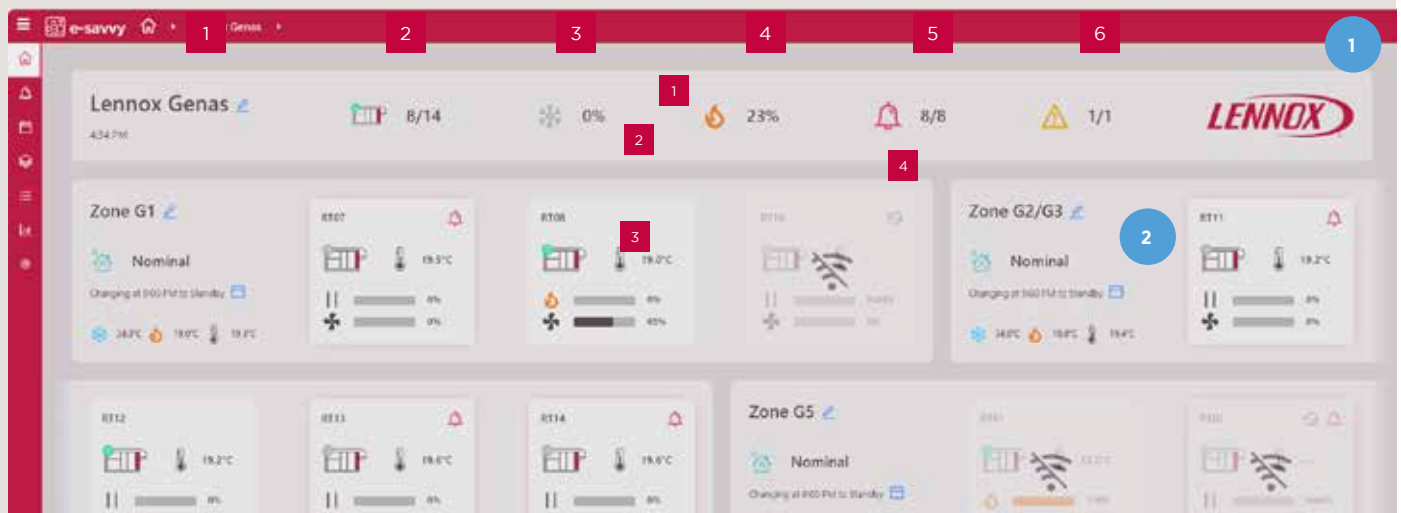
- Compatible with Climatic 60 and eClimatic from Redge
- Electrical load shedding function (stop, 50% and 100% capacity)
- Very easy to install, it is compatible with several devices such as tablets and PC computers
- Alarm function by mail



MODBUS interface is mandatory for any connection between the unit and e-savvy system.

SUMMARY

e-savvy is an intuitive interface which allows to monitor in real time the status of all HVAC devices in the building*;



1 - Status overview

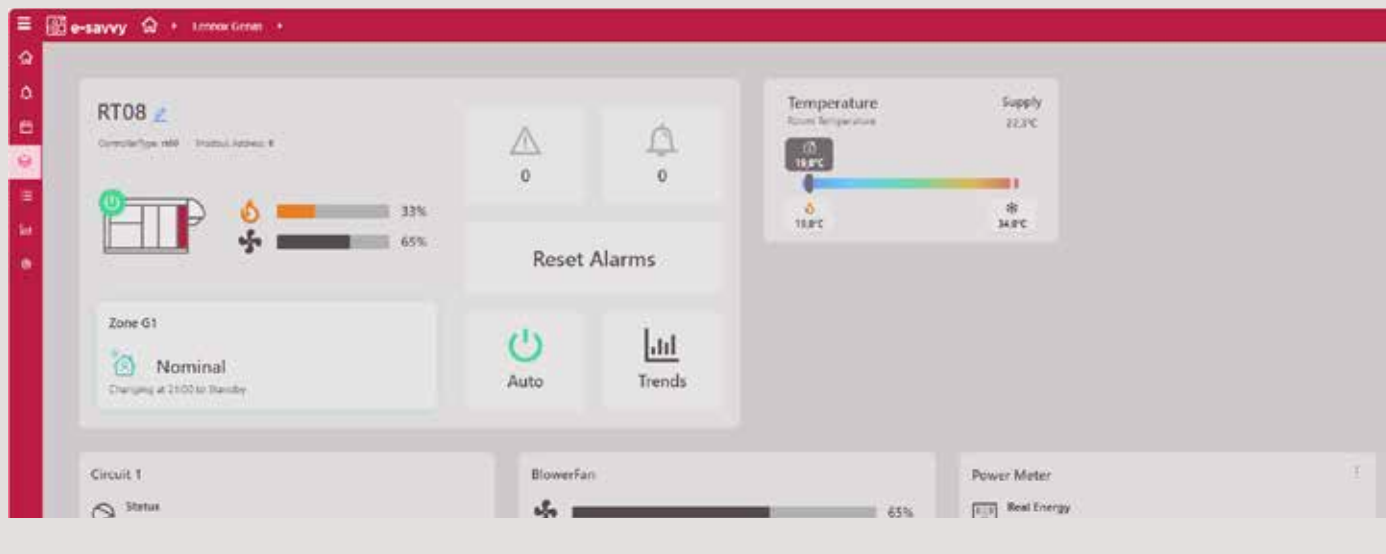
- 1.1 : date and time
- 1.2 : running units / total units
- 1.3 : total load cooling
- 1.4 : total load heating
- 1.5 : number of unacked and active alarms
- 1.6 : number of unacked and active warnings

2 - Zone and units status

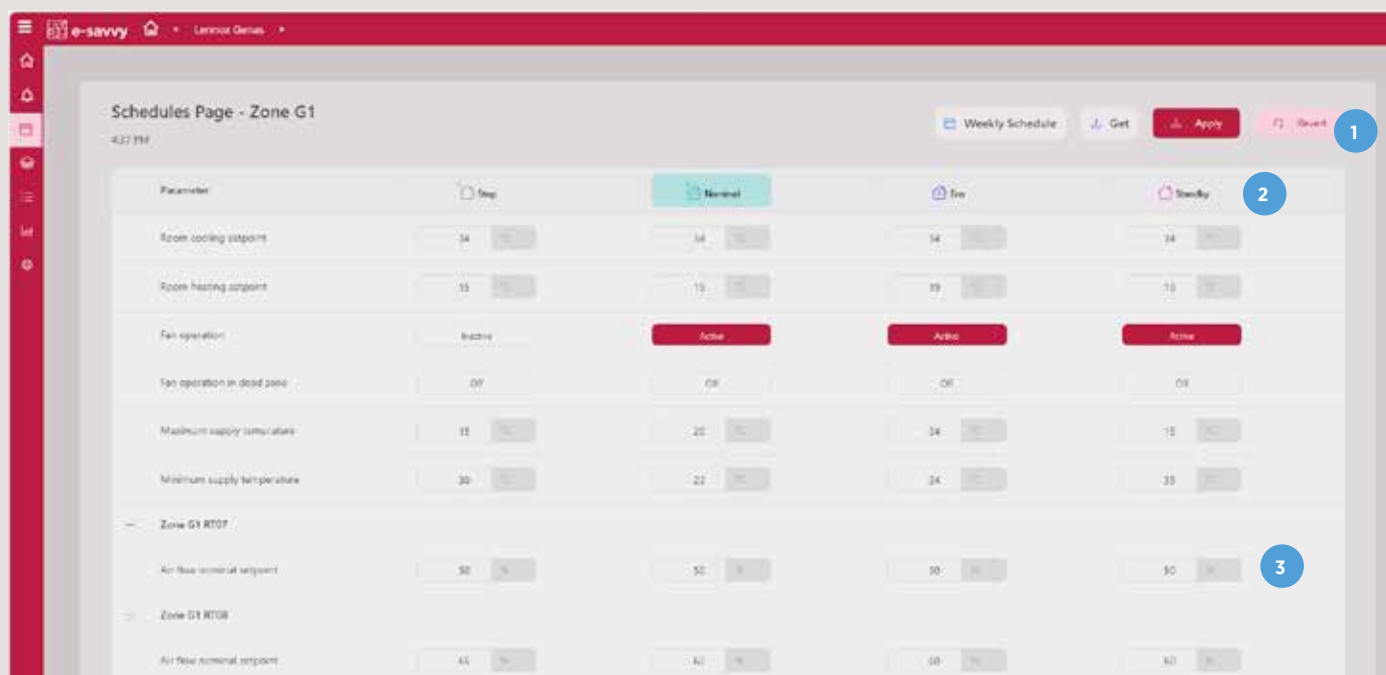
- 2.1 : room name
- 2.2 : actual mode
- 2.3 : room load and temperature
- 2.4 : unit load, fan speed and supply temperature

PRODUCT PAGE

e-savvy is an intuitive interface which allows to monitor in real time the status of all HVAC devices in the building :

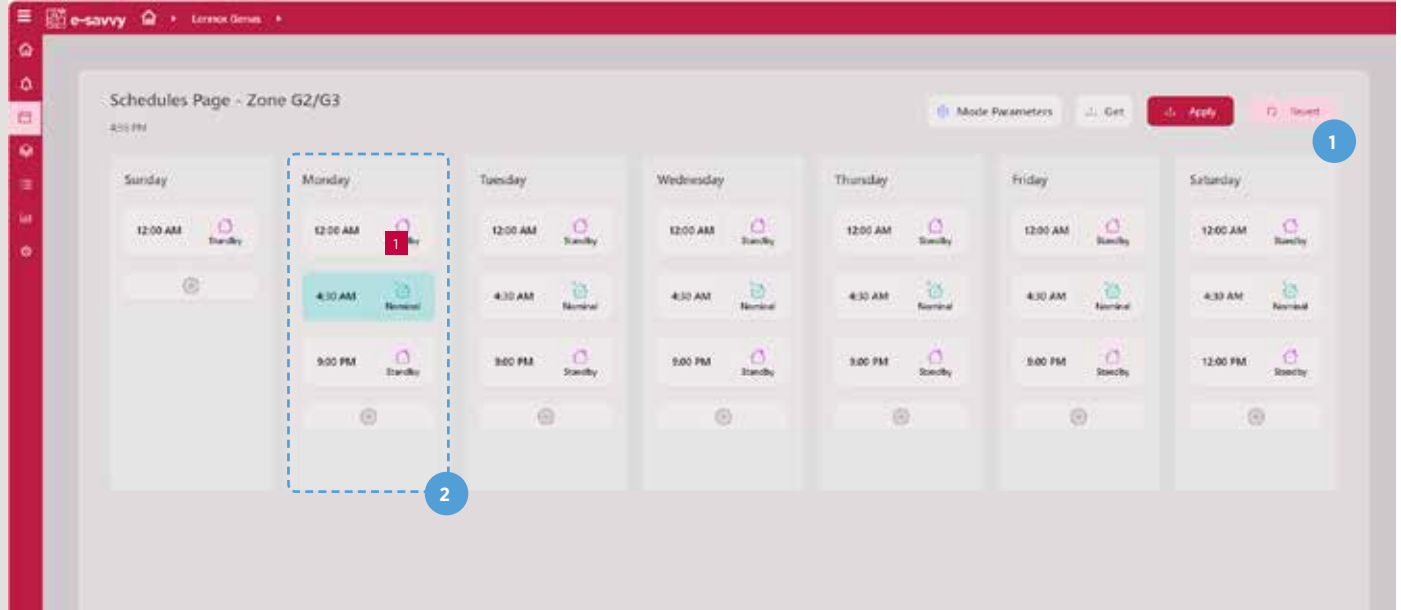


SCHEDULER PAGE



- 1 - Program parameter menu
- 2 - Time slots
- 3 - Zone parameters

SCHEDULE PAGE



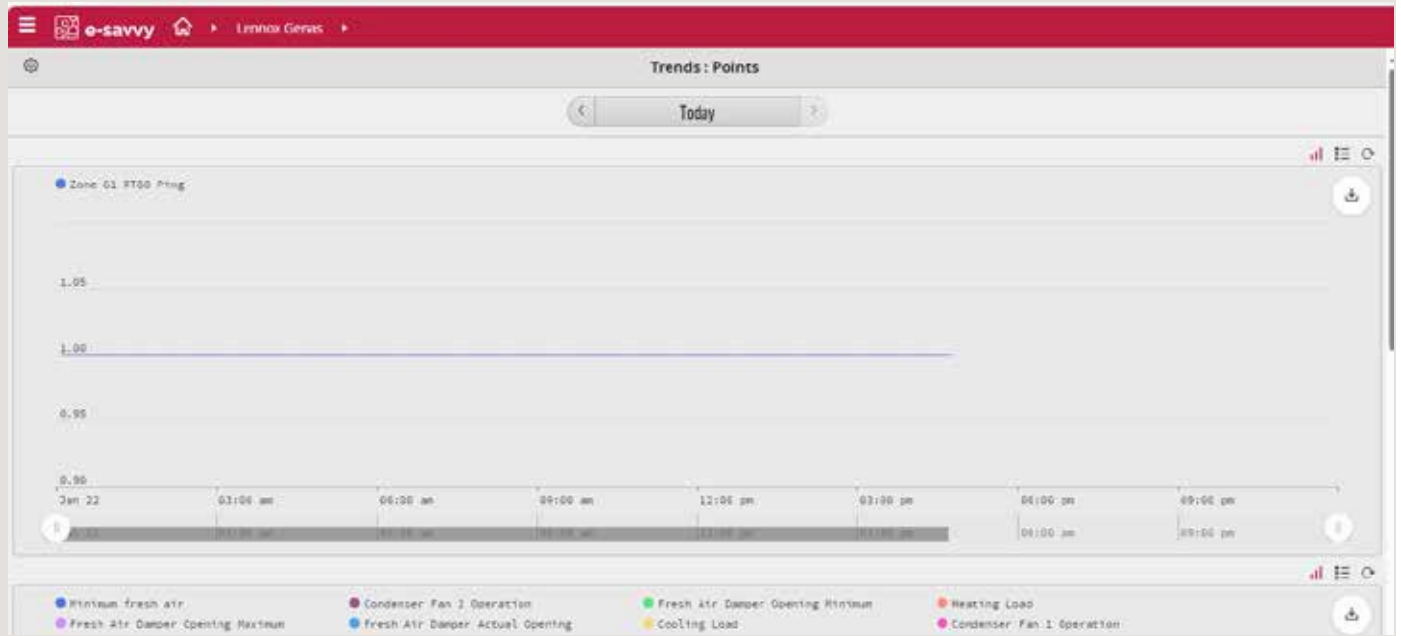
1 - Weekly scheduler menu

2 - Weekly scheduler menu per day

2.1 : start time of the program and mode

TRENDS PAGE

The Trends section allows real-time monitoring of all parameters of the installation.



ALARMS PAGE

e-savvy is a connected system able to send alerts in real time to it's users.

STATUS	DATE/TIME ↑	NAME	SOURCE	STATE	PRIOR.	MESSAGE	ACK	ACK BY
🔴	2024-10-22 11:08 AM	Zone 52/53 RT12 _Alarm Code 117		🔴	4	Circuit 1, Safety Low Pressure, Out -off		
🔴	2024-10-22 11:08 AM	Zone 52/53 RT14 _Alarm Code 117		🔴	4	Circuit 2, Safety Low Pressure, Out -off		
🔴	2024-10-22 11:08 AM	Zone 54 RT09 _Alarm Code 117		🔴	4	Circuit 2, Safety Low Pressure, Out -off		
🔴	2024-10-22 11:08 AM	Zone 55 RT03 _Alarm Code 115		🔴	4	Circuit 1, Safety High Pressure, Out -off		
🔴	2024-10-22 11:08 AM	Zone 56 RT08 _Alarm Code 138		🔴	3	Circuit 2 Compressor, SDP operation 2, (Low Operating Press.)		
🔴	2024-10-22 11:08 AM	Zone 52/53 RT11 _Alarm Code 003		🔴	4	Slower Fan		
🔴	2024-10-22 11:08 AM	Zone 55 RT03 _Alarm Code 040		🔴	4	Slower Fan		
🔴	2024-10-22 11:08 AM	Zone 56 RT08 _Alarm Code 117		🔴	4	Circuit 1, Safety Low Pressure, Out -off		
🔴	2024-10-22 11:08 AM	Zone 51 RT07 _Alarm Code 117		🔴	4	Circuit 1, Safety Low Pressure, Out -off		

GLOBAL LOAD SHEDDING
User can define the best scenario (by zone, workstation, functionality, etc.)

NO CONTROLLER IMPOSITION
Can take over all controllers of the market without modification.

DASHBOARD VIEW
Direct view of products performance on site.

BMS INTEGRATION
Can be plugged on an existing BMS and improve system optimization.

REDGE CLOUD : :CONNECTIVITY FOR VISUALIZATION OF PERFORMANCE

Redge Cloud is a multi site, multi unit connectivity for visualization of performances

Redge cloud is the best tool to remotely monitor and manage all your rooftop and chiller units, independent of their location and condition.

It allows you to monitor and control all units on the same place, from any web browser.

Remotely adjust set points from any installation site through a friendly and self-explanatory layout.

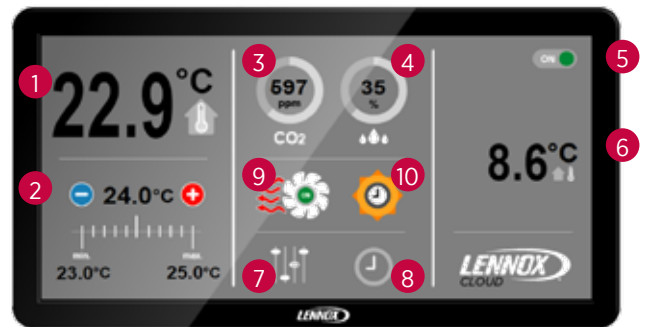
Redge Cloud grants you access to alarm history and dashboards with real-time system performance and energy consumption¹ from the entire installation site or from individual units.



WEBVIEW

Remote adjust of system setpoints:

1. Room temperature;
2. Room temperature set points;
3. Indoor CO2 levels²;
4. Indoor humidity levels³;
5. System ON or OFF button;
6. External temperature;
7. Adjust settings;
8. Adjust time schedule;
9. Fan status;
10. Time schedule status:



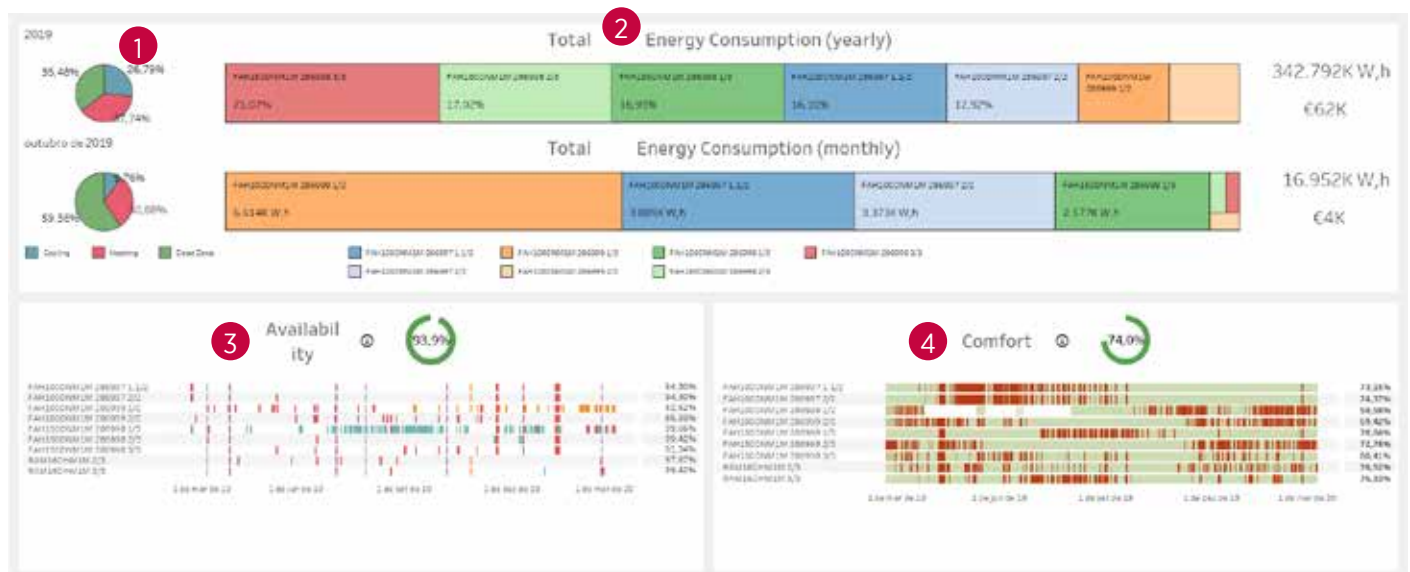
 Dead Zone operation (Fan ON)	 Heating operation (Fan ON)	 Cooling operation (Fan ON)	 System stop (Fan OFF)
-------------------------------------	-----------------------------------	-----------------------------------	---------------------------

 BMS mode (building management system)	 Day 2 mode	 Day 1 mode	 Daytime operation	 Night operation
---	----------------	----------------	-----------------------	---------------------

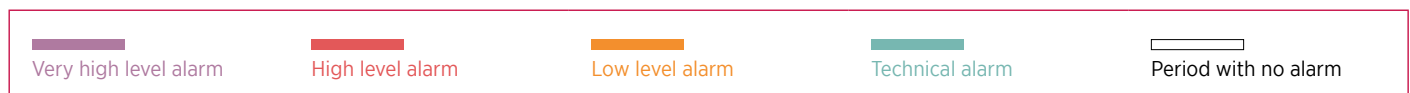
1. Require Electric Energy Meter - optional feature
 2. Require Air Quality Sensor (CO2) - optional feature
 3. Require Humidity Control Pack - optional feature

SITE DASHBOARD

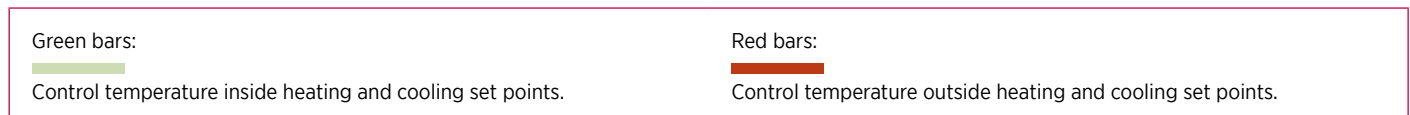
Provides real-time analysis of all units on the installation site.



1. Evaluate cooling, heating and dead zone periods (yearly or monthly);
2. Measure energy consumption¹ of all units on the site (yearly or monthly);
Identify which unit is consuming the most or highlight individual units by selecting them.
3. Identify the unit availability in the designated period by colored bars:



4. Identify average Comfort condition for the selected period:



ANNUAL ENERGY CONSUMPTION COMPARISON
Energy “slices” should keep very similar along the months, if not a check should be done.

TOTAL COST OF OWNERSHIP
Evaluate savings on each maintenance procedure by using real time collected data.

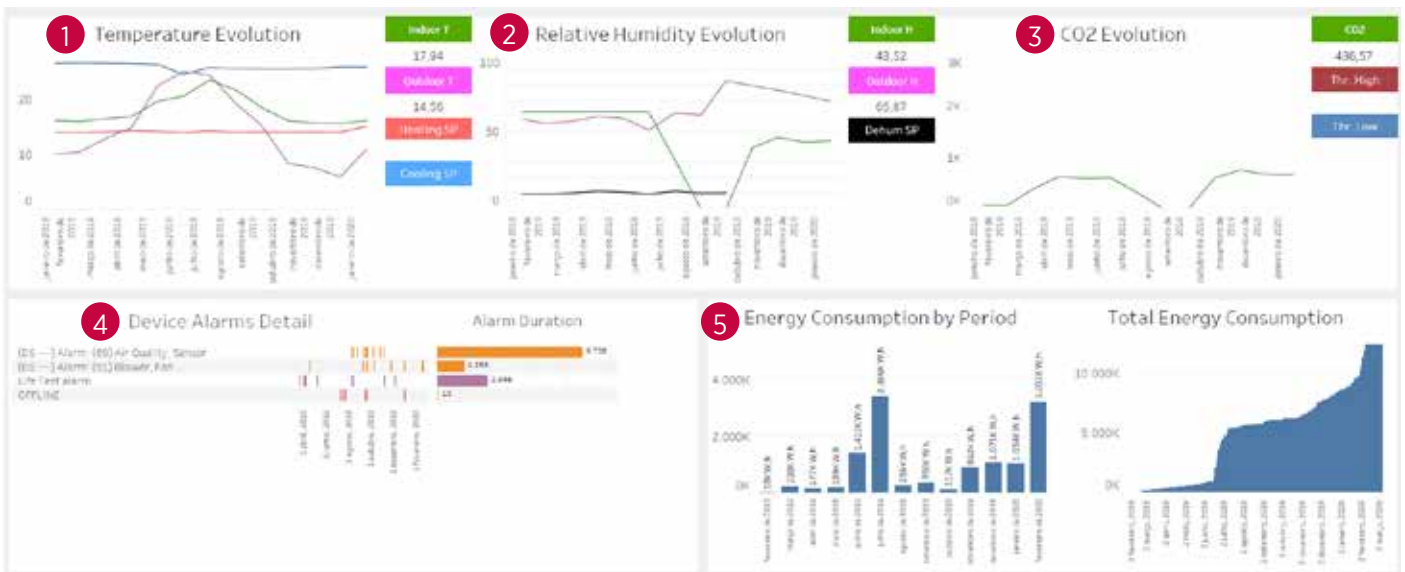
MAINTENANCE & SERVICE TRACKING
Rate the quality of the provided maintenance by checking Alarm frequency and Comfort ratio.

REMOTE MONITORING
Ease identification of proper unit performance by comparing energy consumption.

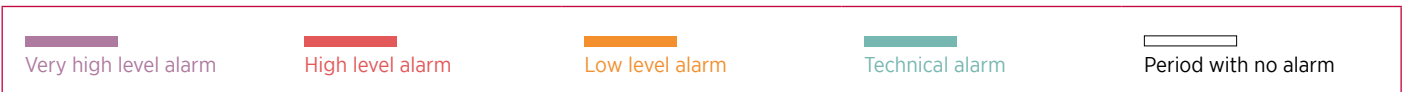
1. Require Electric Energy Meter - optional feature

UNIT DASHBOARD

Provides individual real-time analysis of each unit from the installation site.



1. Evaluate temperature evolution within selected period:
Indoor temperature, outdoor temperature, heating set point and cooling set point.
2. Evaluate Relative Humidity¹ within the selected period:
Indoor humidity, outdoor humidity and dehumidification set point.
3. Evaluate CO2 levels² inside the building and configure Set Point for Fresh Air management on the supply air stream;
4. Identify alarms detail and duration for the specified period:



5. Measure monthly energy consumption³ and the accumulated for the designated period.

REMOTE ADJUSTMENTS
Detect set points changes over time and adjust them remotely.

GUARANTEED COMFORT
Ensure comfort condition at any season with automatic management of humidity¹ and CO2 levels².

MAINTENANCE & SERVICE TRACKING
Rate the quality of the provided maintenance by checking the indoor temperature oscillation.

MAXIMUM PERFORMANCE
Comparing the energy consumption with the outdoor temperature oscillation to evaluate system performance.

1. Require Humidity Control Pack - optional feature
2. Require Air Quality Sensor (CO2) - optional feature
3. Require Electric Energy Meter - optional feature

AIR QUALITY SENSOR (CO2)

All collected data can be remotely managed on e-savvy or the Redge Cloud Webview and Dashboard:

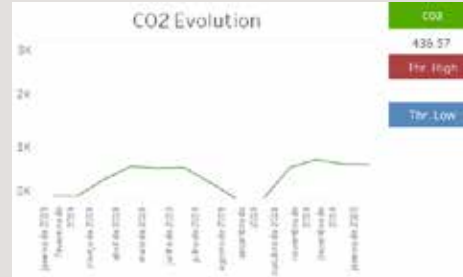
WEBVIEW

- Displays the real-time CO2 level on the indoor air and adjusts the fresh air dampers to improve air quality.



UNIT DASHBOARD

- Real time measurements and display of indoor air quality;
- Allows remote set point configuration through Redge Cloud.



GUARANTEED COMFORT

Ensure comfort condition at any season with automatic management of CO₂ levels inside the building.

HUMIDITY CONTROL PACK

All collected data can be remotely managed on e-savvy or the Redge Cloud Webview and Dashboard:

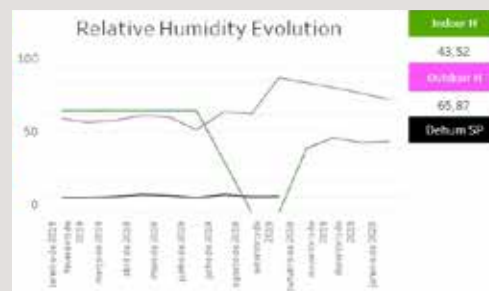
WEBVIEW

- Displays the real-time Relative Humidity of the indoor air and adjusts the fresh airdampers avoid entry of wet air.



UNIT DASHBOARD

- Real time measurements of Relative Humidity for Indoor and Outdoor Air.
- Allows adjustment of Dehumidification Set Point on Redge Cloud.

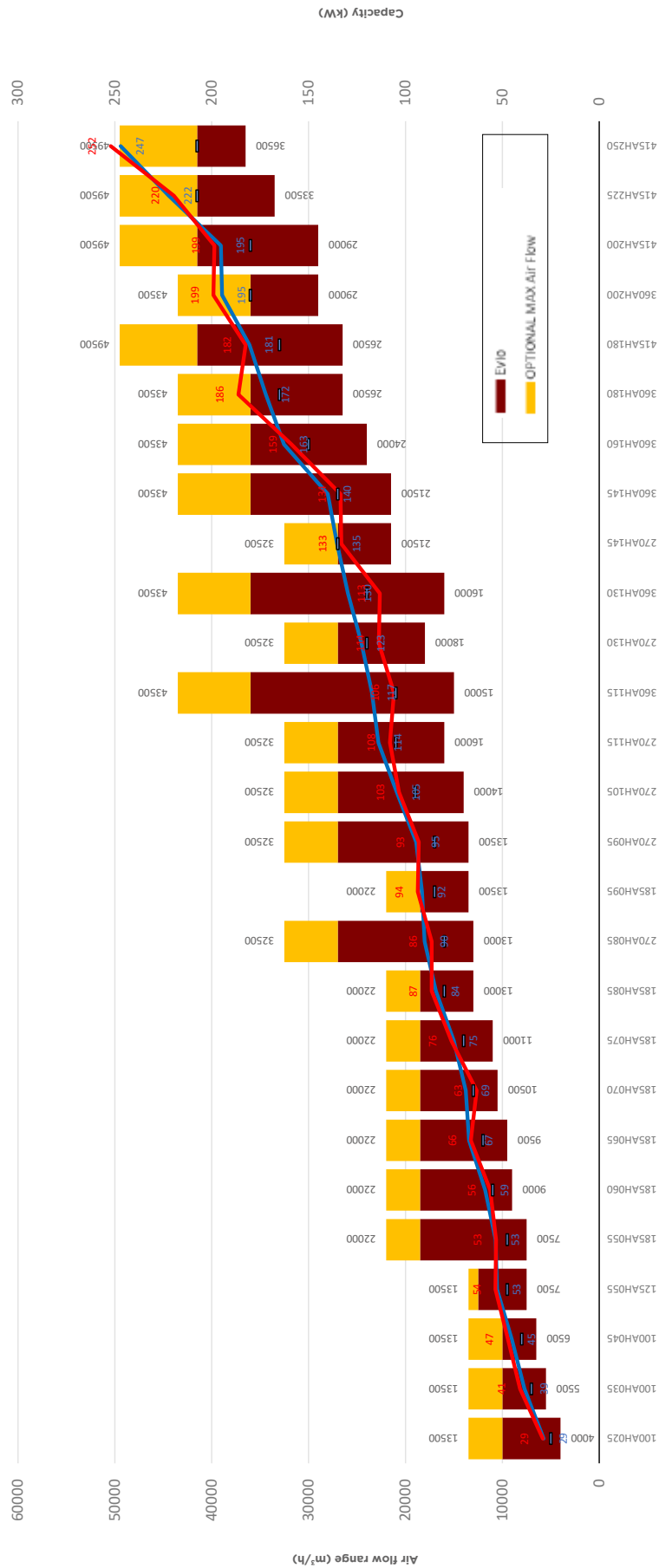


GUARANTEED COMFORT

Ensure comfort condition at any season with automatic management of indoor humidity.

RANGE

HEAT PUMP UNITS





AIR COOLED TABLE

HEAT PUMP UNITS

Evio		100AH			125AH	185AH			
		25	35	45	55	55	60	65	70
Nominal thermal performances - Cooling mode									
Cooling capacity ⁽¹⁾	kW	28.60	38.50	45.00	52.60	53.30	58.80	67.00	68.70
Total Power Input	kW	9.32	13.05	15.90	16.91	15.96	20.56	21.68	24.54
EER net ⁽¹⁾		3.07	2.95	2.83	3.11	3.34	2.86	3.09	2.80
Nominal thermal performances - Heating mode									
Heating capacity ⁽²⁾	kW	29.10	40.90	47.30	53.60	53.40	56.40	66.40	63.40
Total Power Input	kW	7.58	9.78	12.85	14.68	13.09	15.33	19.19	18.17
COP net ⁽²⁾		3.84	4.18	3.68	3.65	4.08	3.68	3.46	3.49
Seasonal efficiencies - Cooling mode									
Seasonal Energy Efficiency Ratio - SEER ⁽³⁾		4.68	4.78	4.65	4.63	4.98	4.93	4.78	4.88
Seasonal energy efficiency - η_{s,c} ⁽⁴⁾	%	184.20	188.20	183.00	182.20	196.20	194.20	188.20	192.20
Eurovent energy efficiency class - Part load operation		B	A	B	B	A	A	A	A
Seasonal efficiencies - Heating mode									
Seasonal Coefficient of Performance - SCOP ⁽⁵⁾		3.73	4.03	4.05	3.58	3.75	3.88	3.43	3.86
Seasonal energy efficiency - η_{s,h} ⁽⁶⁾	%	146.20	158.20	159.00	140.20	147.00	152,02	134.20	151,00
Eurovent energy efficiency class - Part load operation		A	A+	A+	B	A	A+	B	A+
Ventilation data									
Minimum airflow rate	m ³ /h	4000	5500	6500	7500	7500	9000	9500	10500
Nominal airflow rate		5000	7000	8000	9500	9500	11000	12000	13000
Maximum airflow rate		10000	10000	10000	12500	18500	18500	18500	18500
Boosted airflow rate		13500	13500	13500	13500	22000	22000	22000	22000
Acoustic data - Standard unit									
Outdoor sound power	dB(A)	75	75	84	79	78	85	85	85
Indoor blower outlet sound power		69	78	82	87	71	75	77	79
Electrical data									
Maximum power	kW	11,2	13,2	23,4	21,2	23,6	47,3	30,4	37
Starting current	A	79,7	81,1	116,4	114,1	118	177,4	162,7	216,4
Maximum current	A	20,2	23	38,5	36,7	40,6	52,5	51,4	59,8
Short circuit current	kA	10	10	10	10	10	10	10	10
Refrigeration circuit									
Number of circuits		1	1	1	2	2	1	2	1
Number of compressors		2	2	2	3	3	2	3	2
Refrigerant load	kg	6,5	10	9,9	6,6/6,6	6,6/6,6	9,6	6,1/6,1	9,3
Unit weight									
Standard air cooled unit	kg	677	705	735	910	1024	890	1068	893

(1) **Cooling mode** : According to EN14511 nominal conditions - Outdoor temperature 35°C DB - Indoor temperature 27°C DB / 19°C WB
 (2) **Heating mode** : According to EN14511 nominal conditions - Outdoor temperature 7°C DB / 6°C WB - Indoor temperature 20°C DB
 (3) SEER in accordance with standard EN14825.
 (4) Space cooling energy efficiency following Ecodesign regulation EU 2016/2281
 (5) SCOP in accordance with standard EN 14825 (average climate conditions).
 (6) Space heating energy efficiency following Ecodesign regulation EU 2016/2281.



AIR COOLED TABLE

HEAT PUMP UNITS

Evio		185AH			270AH					
		75	85	95	85	95	105	115	130	145
Nominal thermal performances - Cooling mode										
Cooling capacity ⁽¹⁾	kW	74.80	83.90	91.20	89.90	94.40	104.30	113.70	122.20	134.80
Total Power Input	kW	25.79	29.75	32.69	28.45	31.16	34.54	39.34	45.26	50.30
EER net ⁽¹⁾		2.90	2.82	2.79	3.16	3.03	3.02	2.89	2.70	2.68
Nominal thermal performances - Heating mode										
Heating capacity ⁽²⁾	kW	76.50	86.80	94.00	86.60	93.30	103.60	108.40	114.20	133.70
Total Power Input	kW	21.79	25.38	28.66	23.41	25.84	29.10	32.65	37.32	42.04
COP net ⁽²⁾		3.51	3.42	3.28	3.70	3.61	3.56	3.32	3.06	3.18
Seasonal efficiencies - Cooling mode										
Seasonal Energy Efficiency Ratio - SEER ⁽³⁾		4.73	4.58	4.50	5.03	4.98	4.98	4.95	4.90	4.90
Seasonal energy efficiency - η_{s,c} ⁽⁴⁾	%	186.20	180.20	177.00	198.20	196.20	196.20	195.00	193.00	193.00
Eurovent energy efficiency class - Part load operation		A	B	B	A	A	A	A	A	A
Seasonal efficiencies - Heating mode										
Seasonal Coefficient of Performance - SCOP ⁽⁵⁾		3.83	3.63	3.58	3.85	3.80	3.90	3.80	3.73	3.65
Seasonal energy efficiency - η_{s,h} ⁽⁶⁾	%	150.20	142.20	140.20	151.00	149.00	153.00	149.00	146.20	143.00
Eurovent energy efficiency class - Part load operation		A+	A	B	A+	A+	A+	A+	A	A
Ventilation data										
Minimum airflow rate	m ³ /h	11000	13000	13500	13000	13500	14000	16000	18000	21500
Nominal airflow rate		14000	16000	17000	16000	17000	19000	21000	24000	27000
Maximum airflow rate		18500	18500	18500	27000	27000	27000	27000	27000	27000
Boosted airflow rate		22000	22000	22000	32500	32500	32500	32500	32500	32500
Acoustic data - Standard unit										
Outdoor sound power	dB(A)	86	88	88	87	88	87	88	88	88
Indoor blower outlet sound power		81	85	88	77	78	81	83	87	92
Electrical data										
Maximum power	kW	40,3	44,3	52,4	50,5	49,6	52,6	58,2	64,2	77,6
Starting current	A	186,2	198,6	206,2	207,3	201,9	200,1	221,8	263,9	286,3
Maximum current	A	66,7	74,1	86,7	82,8	82,4	88,9	97,4	107,7	130,1
Short circuit current	kA	10	10	10	10	10	10	10	10	10
Refrigeration circuit										
Number of circuits		2	2	2	2	2	2	2	2	2
Number of compressors		3	3	3	3	3	4	4	4	4
Refrigerant load	kg	10/10	9,9/9,9	9,7/9,7	10/10	9,9/9,9	10/10	9,7/9,7	9,5/9,7	13/13,1
Unit weight										
Standard air cooled unit	kg	1125	1161	1178	1260	1265	1316	1339	1365	1542

(1) **Cooling mode** : According to EN14511 nominal conditions - Outdoor temperature 35°C DB - Indoor temperature 27°C DB / 19°C WB
 (2) **Heating mode** : According to EN14511 nominal conditions - Outdoor temperature 7°C DB / 6°C WB - Indoor temperature 20°C DB
 (3) SEER in accordance with standard EN14825.
 (4) Space cooling energy efficiency following Ecodesign regulation EU 2016/2281
 (5) SCOP in accordance with standard EN 14825 (average climate conditions).
 (6) Space heating energy efficiency following Ecodesign regulation EU 2016/2281.



AIR COOLED TABLE

HEAT PUMP UNITS

		360AH					
Evio		115	130	145	160	180	200
Nominal thermal performances - Cooling mode							
Cooling capacity ⁽¹⁾	kW	117.10	129.40	139.80	162.10	171.40	193.90
Total Power Input	kW	38.90	44.16	47.71	55.51	62.33	70.00
EER net ⁽¹⁾		3.01	2.93	2.93	2.92	2.75	2.77
Nominal thermal performances - Heating mode							
Heating capacity ⁽²⁾	kW	106.20	113.50	133.90	159.40	186.90	199.90
Total Power Input	kW	30.96	34.92	38.59	49.81	54.17	58.79
COP net ⁽²⁾		3.43	3.25	3.47	3.20	3.45	3.40
Seasonal efficiencies - Cooling mode							
Seasonal Energy Efficiency Ratio - SEER ⁽³⁾		5.25	5.20	5.18	5.00	4.78	5.08
Seasonal energy efficiency - η_{s,c} ⁽⁴⁾	%	207.00	205.00	204.20	197.00	188.20	200.20
Eurovent energy efficiency class - Part load operation		A+	A+	A+	A	A	A
Seasonal efficiencies - Heating mode							
Seasonal Coefficient of Performance - SCOP ⁽⁵⁾		3.93	3.88	3.80	3.63	3.98	4.20
Seasonal energy efficiency - η_{s,h} ⁽⁶⁾	%	154.20	152.20	149.00	142.20	156.20	165.00
Eurovent energy efficiency class - Part load operation		A+	A+	A+	A	A+	A+
Ventilation data							
Minimum airflow rate	m ³ /h	15000	16000	21500	24000	26500	29000
Nominal airflow rate		21000	24000	27000	30000	33000	36000
Maximum airflow rate		36000	36000	36000	36000	36000	36000
Boosted airflow rate		43500	43500	43500	43500	43500	43500
Acoustic data - Standard unit							
Outdoor sound power	dB(A)	88	88	89	91	91	91
Indoor blower outlet sound power		78	81	84	87	91	94
Electrical data							
Maximum power	kW	60,6	66,6	72,2	85,1	102	109,4
Starting current	A	225,8	267,8	277,9	297,2	326,4	421,8
Maximum current	A	101,3	111,6	121,7	141	170,2	180,6
Short circuit current	kA	10	10	10	10	10	10
Refrigeration circuit							
Number of circuits		2	2	2	2	2	2
Number of compressors		4	4	4	4	4	4
Refrigerant load	kg	9,9/9,9	9,5/9,7	13,1/13,1	12,7/12,7	20,9/20,9	20,9/20,3
Unit weight							
Standard air cooled unit	kg	1494	1516	1679	1809	1918	1970

(1) **Cooling mode** : According to EN14511 nominal conditions - Outdoor temperature 35°C DB - Indoor temperature 27°C DB / 19°C WB

(2) **Heating mode** : According to EN14511 nominal conditions - Outdoor temperature 7°C DB / 6°C WB - Indoor temperature 20°C DB

(3) SEER in accordance with standard EN14825.

(4) Space cooling energy efficiency following Ecodesign regulation EU 2016/2281

(5) SCOP in accordance with standard EN 14825 (average climate conditions).

(6) Space heating energy efficiency following Ecodesign regulation EU 2016/2281.



AIR COOLED TABLE

HEAT PUMP UNITS

Evio		415AH			
		180	200	225	250
Nominal thermal performances - Cooling mode					
Cooling capacity ⁽¹⁾	kW	180.00	194.70	222,2	247,1
Total Power Input	kW	62.07	69.78	81,9	87,3
EER net ⁽¹⁾		2.90	2.79	2,71	2,83
Nominal thermal performances - Heating mode					
Heating capacity ⁽²⁾	kW	183.00	199.30	222,2	247,1
Total Power Input	kW	51.12	58.27	81,9	87,3
COP net ⁽²⁾		3.58	3.42	2,71	2,83
Seasonal efficiencies - Cooling mode					
Seasonal Energy Efficiency Ratio - SEER ⁽³⁾		5.10	5.23	5	4,53
Seasonal energy efficiency - η_{s,c} ⁽⁴⁾	%	201.00	206.20	197	178
Eurovent energy efficiency class - Part load operation		A	A+	-	-
Seasonal efficiencies - Heating mode					
Seasonal Coefficient of Performance - SCOP ⁽⁵⁾		4.18	4.30	4,08	3,63
Seasonal energy efficiency - η_{s,h} ⁽⁶⁾	%	164.20	169.00	160	142
Eurovent energy efficiency class - Part load operation		A+	A+	-	-
Ventilation data					
Minimum airflow rate	m ³ /h	26500	29000	33500	36500
Nominal airflow rate		33000	36000	41500	41500
Maximum airflow rate		41500	41500	41500	41500
Boosted airflow rate		49500	49500	49500	49500
Acoustic data - Standard unit					
Outdoor sound power	dB(A)	91	91	93	93
Indoor blower outlet sound power		91	94	98	93
Electrical data					
Maximum power	kW	102	109,4	122,1	136
Starting current	A	326,4	421,8	443,5	465,2
Maximum current	A	170,2	180,6	202,3	224,1
Short circuit current	kA	10	10	10	10
Refrigeration circuit					
Number of circuits		2	2	2	2
Number of compressors		4	4	4	4
Refrigerant load	kg	21,2/20,9	21,2/20,4	20,5/20,3	20,3/20
Unit weight					
Standard air cooled unit	kg	2058	2085	2114	2204

(1) **Cooling mode** : According to EN14511 nominal conditions - Outdoor temperature 35°C DB - Indoor temperature 27°C DB / 19°C WB

(2) **Heating mode** : According to EN14511 nominal conditions - Outdoor temperature 7°C DB / 6°C WB - Indoor temperature 20°C DB

(3) SEER in accordance with standard EN14825.

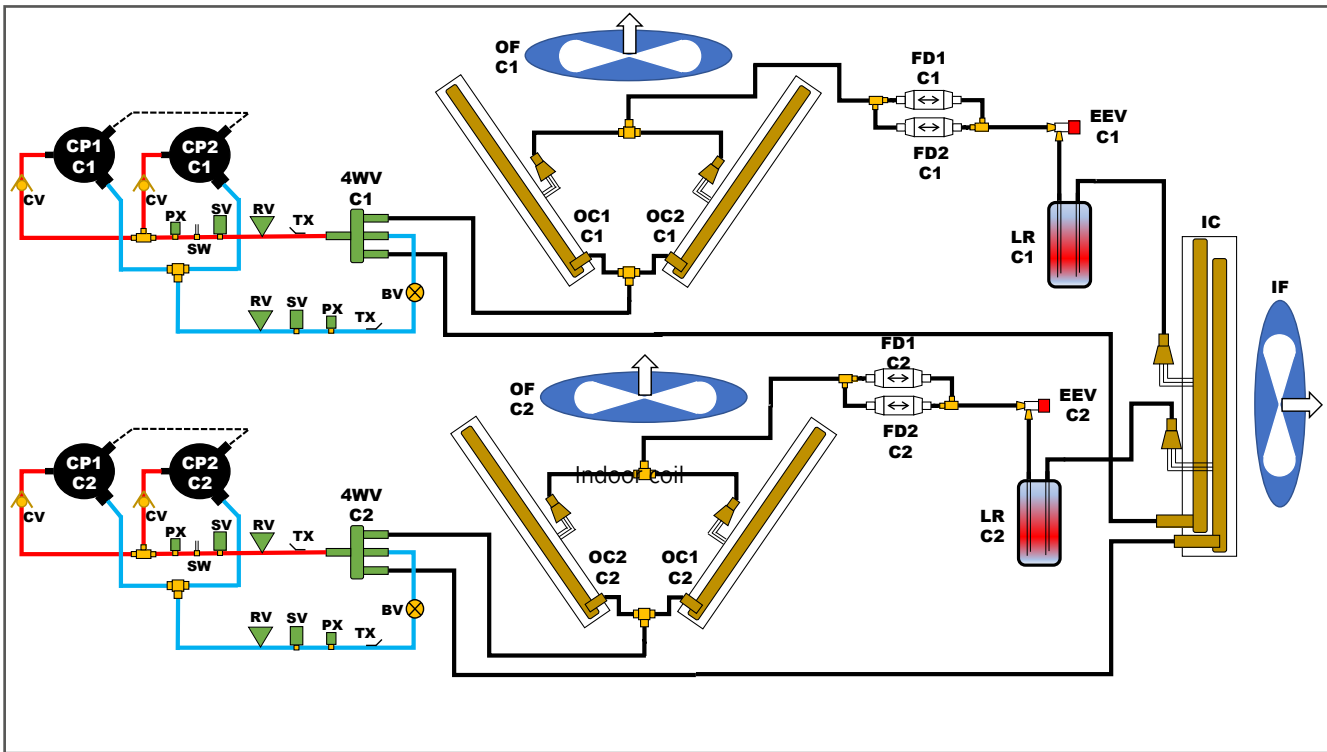
(4) Space cooling energy efficiency following Ecodesign regulation EU 2016/2281

(5) SCOP in accordance with standard EN 14825 (average climate conditions).

(6) Space heating energy efficiency following Ecodesign regulation EU 2016/2281.

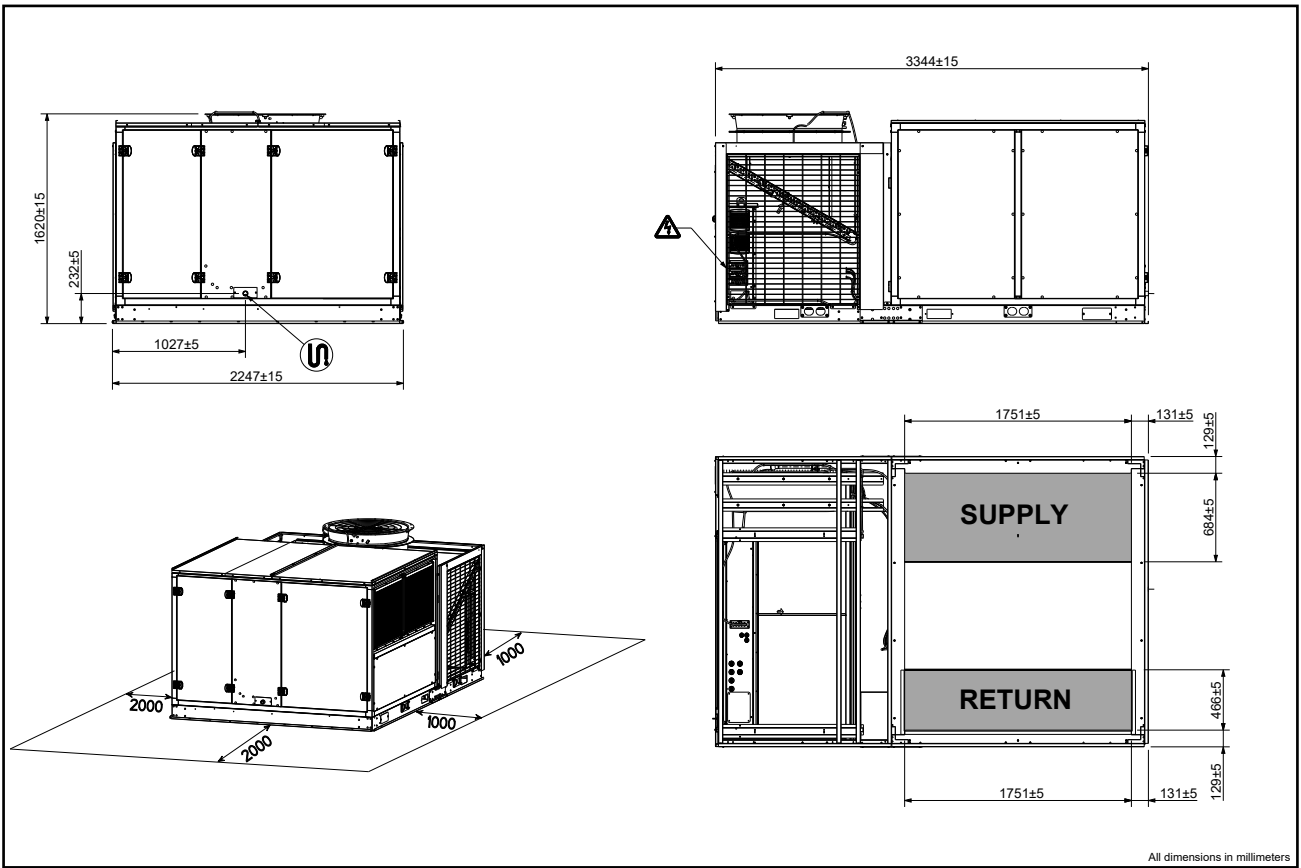


AIR COOLED UNITS

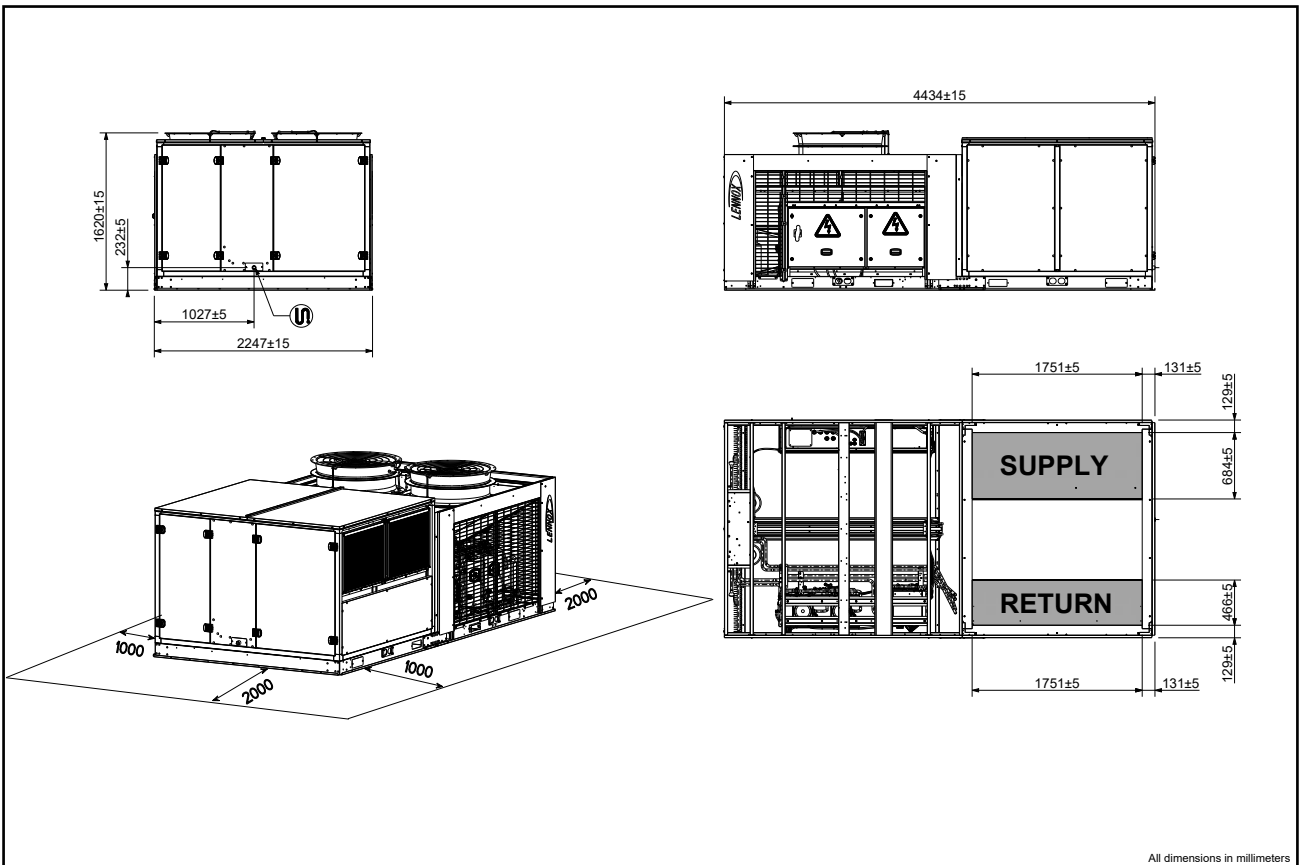


CPXCX	COMPRESSOR	4WVCX	4-WAY VALVE
CV	CHECK VALVE	OCXCX	OUTDOOR COIL
PX	PRESSURE SENSOR	OFCX	OUTDOOR FAN(S)
SW	HIGH PRESSURE SWITCH	FDXCX	FILTER DRIER
RV	PRESSURE RELIEF VALVE	LRCX	LIQUID RECEIVER
TX	TEMPERATURE SENSOR	IC	INDOOR COIL
BV	BALL VALVE	IF	INDOOR FAN(S)
SV	SERVICE VALVE CONNECTION		

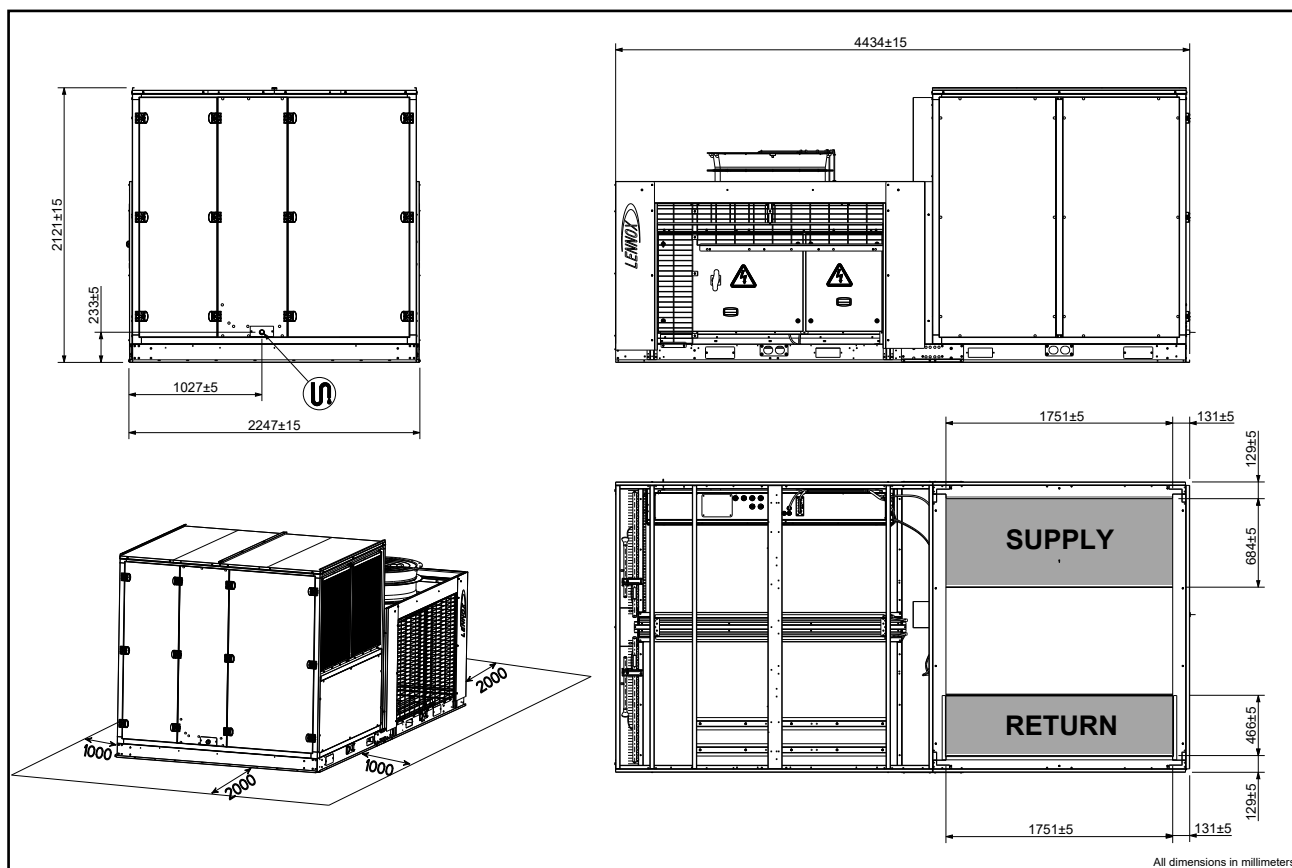
EV185AH 060 - 070



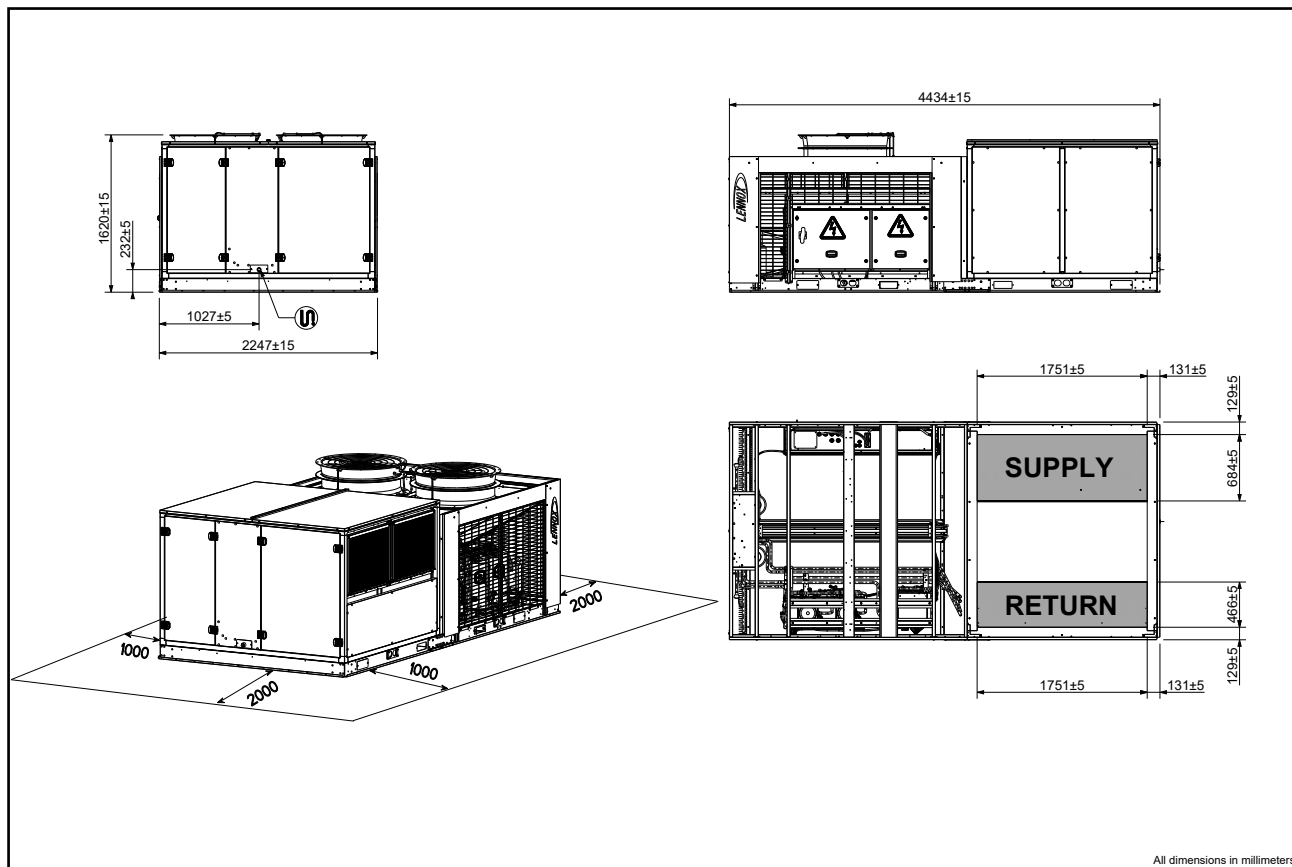
EV185AH 055 - 065 - 075 - 085 - 095



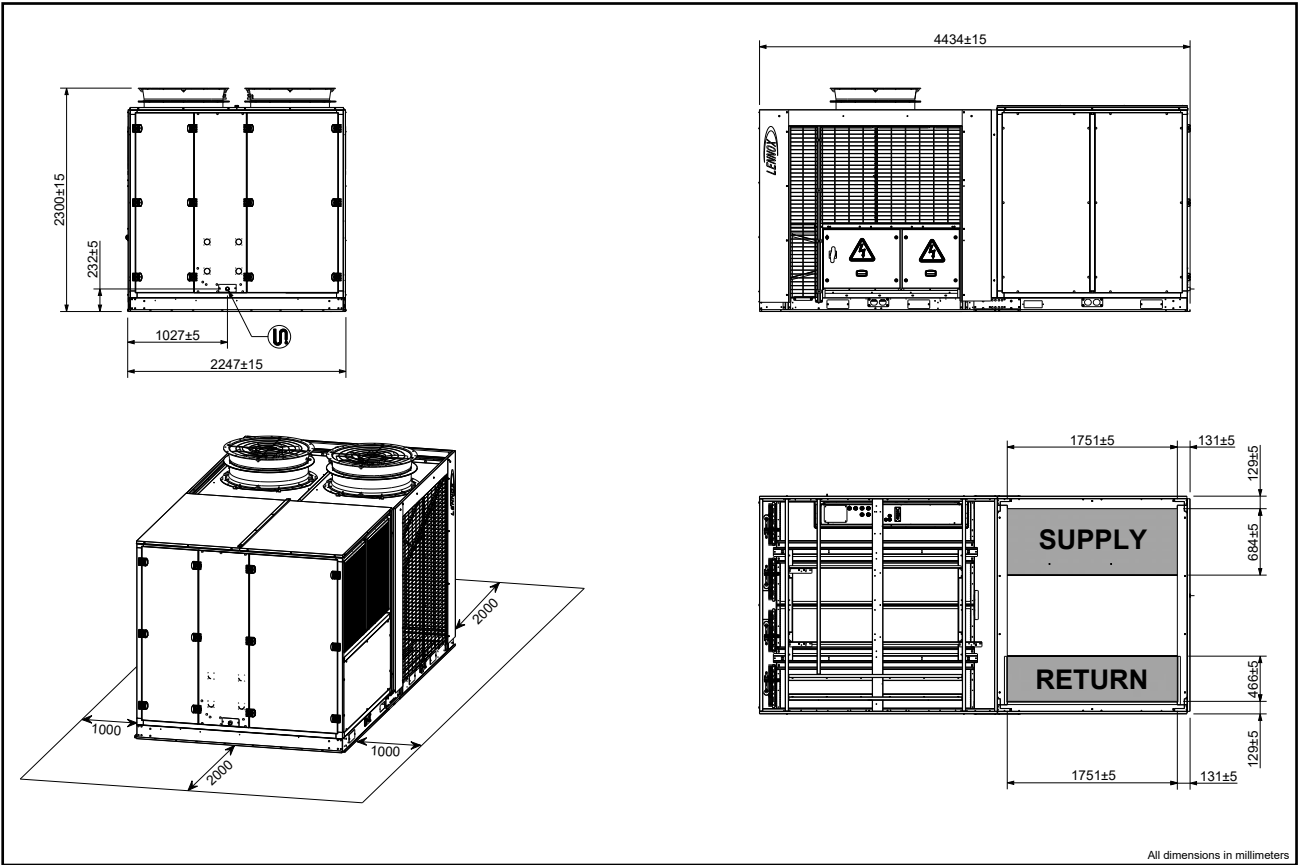
EV270AH 085 - 095



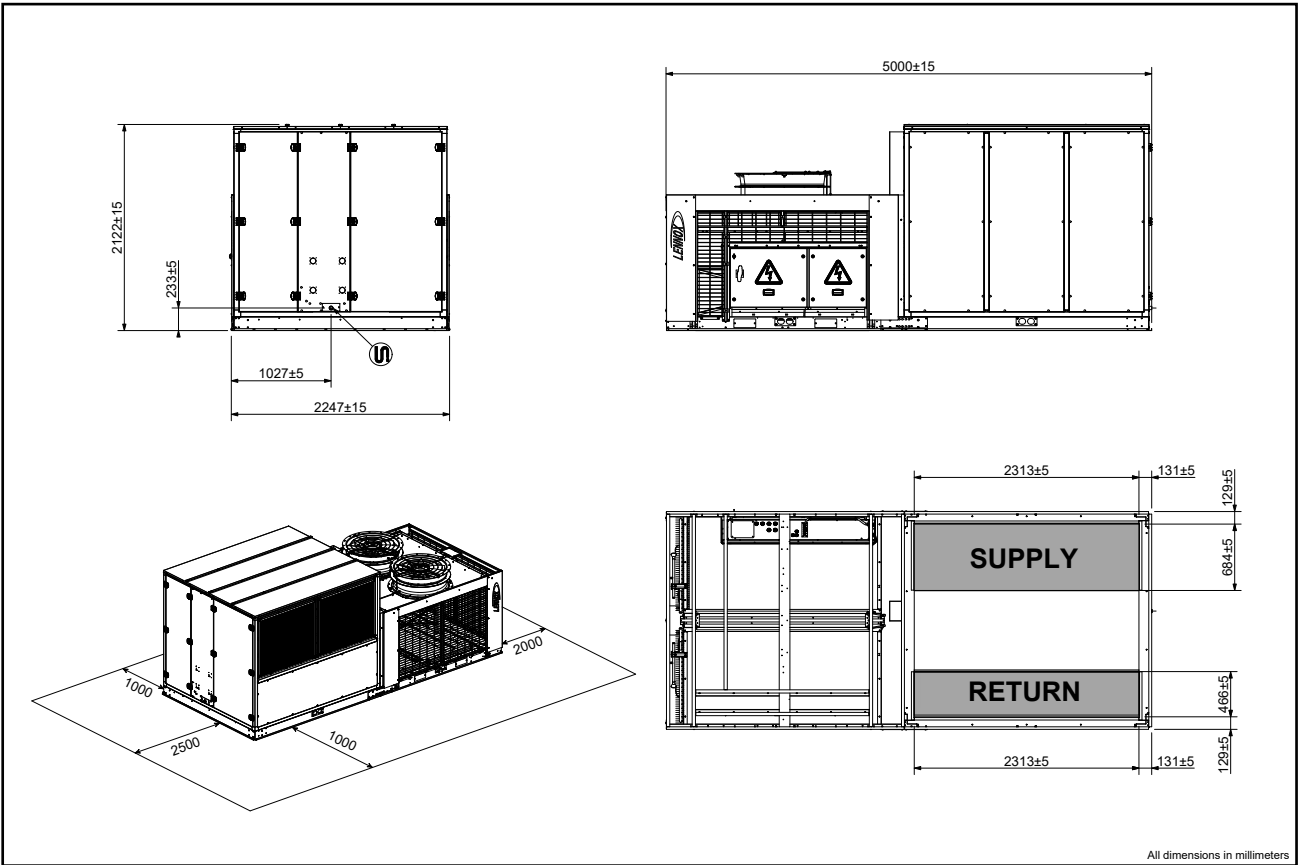
EV270AH 105 - 115 - 130



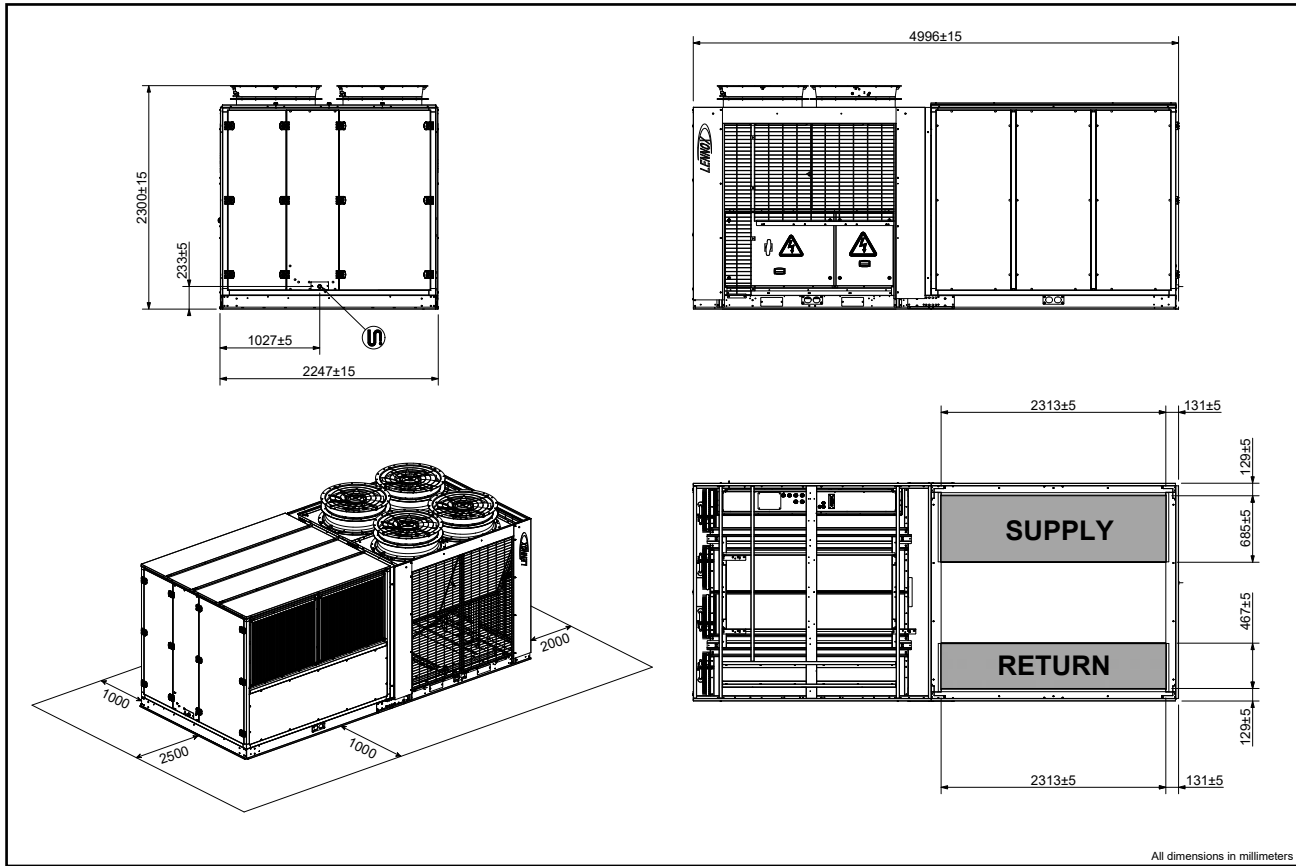
EV270AH 145



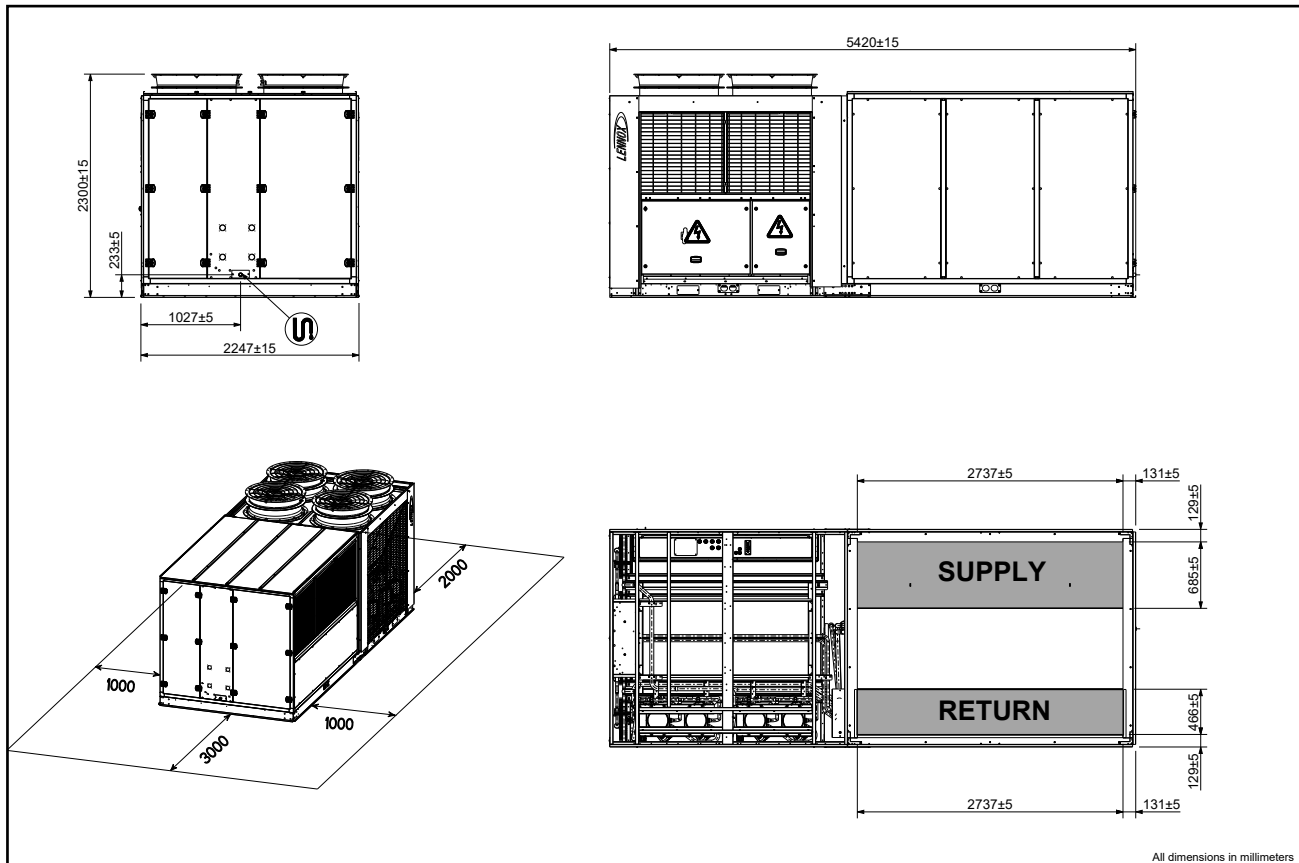
EV360AH 115 - 130



EV360AH 145 - 160 - 180 - 200



EV415AH 180 - 200 - 225 - 250



Due to LFB GROUP ongoing commitment to quality, the specifications, ratings and dimensions are subject to change without notice and without incurring liability. Improper installation, adjustment, alteration, service or maintenance can cause property damage or personal injury. Installation and service must be performed by a qualified installer and servicing agency.

redge[®]

brand of LFB GROUP

Headquarters LFB GROUP

7 rue des Albatros - Z.I. Les Meurières, 69780 Mions - France

+33 (0) 810 502 502

www.redgehvac.com