

Climaveneta Technical Bulletin

WSM2_0264_0604_201801_EN



WSM2 / WSM2-T



0264 - 0604
82 - 182 kW

Fully-configurable and high-efficiency air-source
reverse-cycle and cooling only rooftop unit



(The photo of the unit is purely indicative and may vary depending on the model)

- Maximum flexibility
- Very high reliability
- High versatility
- Three types of heat recovery available



CERTIFICATIONS

Product certifications



System certifications



Climaveneta S.p.A.:

Quality System complying with the requirements of UNI EN ISO9001:2008 regulation

Environmental Management System complying with the requirements of UNI EN
ISO14001:2004 regulation

SUMMARY

1. LEED RELEVANT PRODUCT	pg. 4
2. PRODUCT PRESENTATION	6
3. MAIN COMPONENTS	7
4. DESCRIPTION OF THE UNIT	10
5. ACCESSORIES	21
6. GENERAL TECHNICAL SPECIFICATIONS	27
7. OPERATING LIMITS	43
8. DIMENSIONAL DRAWINGS	46

The units highlighted in this publication contain HFC R410A [GWP₁₀₀ 2088] fluorinated greenhouse gases.

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Read this document carefully.

All work must be performed, components selected and materials used professionally and in complete accordance with the legislation in force in material in the country concerned, and considering the operating conditions and intended uses of the system, by qualified personnel.

The data contained in this publication may be changed without prior notice.

1. LEED RELEVANT PRODUCT

The LEED protocol is the most known protocol of sustainability to define and measure “green buildings” all around the world. Based on existing and proven technology, it evaluates environmental performance from a whole building perspective over a building’s life cycle, providing a definitive standard for what constitutes a green building in design, construction and operation. The LEED rating systems are designed for rating new and existing commercial, institutional and residential buildings. They are based on accepted energy and environmental principle and strike a balance between known, established practices and emerging concepts.

Each rating system is organized into 7 environmental categories: Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality, Innovation in Design and Regional Bonus.



The units are compliant with the performance standard contained in the protocol of sustainability LEED. In detail, units contribute to the following points:

- prerequisite 2 in ENERGY & ATMOSPHERE topic
The units, upon check of the commercial office, are ASHRAE 90.1 – 2007 compliant.
The “Minimum Efficiency Requirements” detailed in the table 6.8.1A/B of the American standard are guaranteed.

TABLE 6.8.1A Electrically Operated Unitary Air Conditioners and Condensing Units—
Minimum Efficiency Requirements

Equipment Type	Size Category	Heating Section Type	Sub-Category or Rating Condition	Minimum Efficiency ^a	Test Procedure ^b
Air Conditioners, Air Cooled	≥ 65,000 Btu/h and <135,000 Btu/h	Electric Resistance (or None)	Split System and Single Package	10.3 EER (before 1/1/2010) 11.2 EER (as of 1/1/2010) <u>11.4 IEER (as of 1/1/2010)</u>	ARI 340/360
		All other	Split System and Single Package	10.1 EER (before 1/1/2010) 11.0 EER (as of 1/1/2010) <u>11.2 IEER (as of 1/1/2010)</u>	
	≥ 135,000 Btu/h and <240,000 Btu/h	Electric Resistance (or None)	Split System and Single Package	9.7 EER (before 1/1/2010) 11.0 EER (as of 1/1/2010) <u>11.2 IEER (as of 1/1/2010)</u>	
		All other	Split System and Single Package	9.5 EER (before 1/1/2010) 10.8 EER (as of 1/1/2010) <u>11.0 IEER (as of 1/1/2010)</u>	
	≥ 240,000 Btu/h and <760,000 Btu/h	Electric Resistance (or None)	Split System and Single Package	9.5 EER (before 1/1/2010) 10.0 EER (as of 1/1/2010) 9.7 IPLV (before 1/1/2010) <u>10.1 IEER (as of 1/1/2010)</u>	
		All other	Split System and Single Package	9.3 EER (before 1/1/2010) 9.8 EER (as of 1/1/2010) 9.5 IPLV (before 1/1/2010) <u>9.9 IEER (as of 1/1/2010)</u>	
	≥ 760,000 Btu/h	Electric Resistance (or None)	Split System and Single Package	9.2 EER (before 1/1/2010) 9.7 EER (as of 1/1/2010) 9.4 IPLV (before 1/1/2010) <u>9.8 IEER (as of 1/1/2010)</u>	
		All other	Split System and Single Package	9.0 EER (before 1/1/2010) 9.5 EER (as of 1/1/2010) 9.2 IPLV (before 1/1/2010) <u>9.6 IEER (as of 1/1/2010)</u>	

- prerequisite 3 in ENERGY & ATMOSPHERE topic
The units use refrigerant R410A, which is compliant with the GWP limitations set by the protocol. In detail, this refrigerant isn't a (CFC)-based refrigerant as moreover prescribed by the most of the national legislation around the world.
- credit 1 in INDOOR ENVIRONMENTAL QUALITY topic
The units may be provided with a CO2 probe to constantly monitor the indoor air quality and therefore set the optimum ventilation conditions. This characteristic, together with the measurement of the fresh air flow to be injected into the room (at customer care), is considered in the "OUTDOOR AIR DELIVERY MONITORING" credit, which weights for 1 point in the LEED protocol.
- credit 2 in INDOOR ENVIRONMENTAL QUALITY topic
LEED protocol rewarded with 1 point the buildings with an air treatment plant designed to grant the maximum IAQ. In detail, if the air treatment units can assure an additional fresh air injection, a smart management of the recovery of the rejected heat for the air renewal and the capability to implement free cooling mode when convenient, 1 point can be gained. The units can all be provided with these optional on request.
- credit 5 in INDOOR ENVIRONMENTAL QUALITY topic
The units are available with high performing filters, F7 and electronic ones, that assure an advanced air filtration minimizing the building occupant exposure to potentially hazardous particulates and chemical pollutants. This credit "INDOOR CHEMICAL AND POLLUTANT SOURCE CONTROL" weights for 1 point in the scoring system
- credit 7 in INDOOR ENVIRONMENTAL QUALITY topic
This credit implies up to 1 point for the buildings characterized by a comfortable thermal environment that promotes occupant productivity and well-being. All the units, thanks to the advanced thermoregulation logics, the adoption of well-sized humidifiers and post-heating coils, grant a precise and fine regulation of the most important variables, ensuring the highest indoor air quality.

Other points can be gained as indirect consequence of an high efficient air conditioning system choice. In particular:

- credit 1 in ENERGY & ATMOSPHERE topic
The units, especially the CA and CA-E versions, contribute to "OPTIMIZE ENERGY PERFORMANCE" of the building. As known, air-conditioning and ventilation systems are responsible for approximately a third of the total energy consumption in a modern building. The proper size and design of each component involved in comfort creation determine a relevant energy saving, prize by LEED protocol with up to 19 points. The amount of points assigned to the building depend to the percentage of energy saving calculated compared with the baseline building performance rating: 1 point for an improvement in energy performance of 12% and 19 points for energy improvement higher than 48%. The baseline building performance are defined according to Appendix G of ASHRAE standard 90.1 – 2007.

- credit 1 in INNOVATION IN DESIGN topic
5 more points can be gained by design teams and projects that achieve exceptional performance above the requirements set by the LEED Green Building Rating System and/or adopt innovative solution not specifically addressed by the LEED Green Building Rating System.
All units use the thermodynamic effect of the exhaust air on the external coil, to recover the heat rejected for the air renewal and improve the working conditions of the cooling circuit. Moreover the units are all capable to operate with variable air flow according to the thermal load and are suitable to be provided with latest generation filters: these advanced design techniques could be classified as innovative and therefore contribute to achieve some points in this topic.

MEHITS S.p.A. is a Green Building Council Italy and actively supports the diffusion of LEED practice all around the world



There are already several buildings LEED certified also tank to MEHITS S.p.A. HVAC systems. For more information, browse the project reference list at www.climaveneta.com

GLOSSARY

- GWP:** *Global Warming Potential*
Index that express the contribution given by a greenhouse effect gas emission into the atmosphere. All the molecules have a potential defined in relation to the CO2 molecule, which has a potential of 1 and acts as a reference.
- CFC:** *ChloroFluoroCarbon*
- LCGWP:** *Life Cycle Global Warming Potential*
Index that define a threshold for the global warming potential estimated for the product life-cycle. It is a function of the following variables:
- refrigerant GWP
 - refrigerant leakage rate and end-of-life refrigerant loss
 - estimated equipment life
 - refrigerant charge
- IAQ:** *Indoor air quality*

2. PRODUCT PRESENTATION

The WSM2 units are packaged reverse-cycle (WSM2) or cooling only (WSM2-T) air-air units developed based on the extensive experience of MEHITS S.p.A. in the design and construction of rooftop units.

This packaged solution directly serving the air-conditioned ambient optimises the system and simplifies installation, thanks to the flexibility and operating versatility guaranteed by the WSM2 range.

According to the selected version, these units provide complete air handling and ventilation in large surface and volume ambients, such as supermarkets, shopping or exhibition centres.

All models come with a double refrigerant circuit, scroll compressors, R410A refrigerant and EC plug fans.

The units can be customised by choosing different air handling sections, accessories and four types of heat recovery on the exhaust air.

2.2 Maximum flexibility

Maximum freedom in choosing the direction of air flows, both supply and return, means the units can be adapted to all installation contexts.

The building's constructional limits can therefore be overcome, offering a highly flexible solution.

In addition, ducting installation is much easier, as there are no restrictions in unit layout regarding the position of the supply and return duct connections.

2.3 High reliability

One of the main features of rooftop units is that they serve the system directly, and in many cases are the sole source of room air-conditioning.

As a result, it is fundamental to guarantee continuous and efficient unit operation in all conditions or situations that may arise.

The WSM2 units respond perfectly to this requirement, as all models feature two completely independent refrigerant circuits.

This means that in the event of a fault on one of the circuits or during defrost cycles for heat pump versions, the unit does not deliver cold air in winter.

2.4 High versatility

Each application has different needs, all of which require an optimum response. There may be applications requiring less specialised units in which the rooftop works as an integration of other systems, or vice-versa applications in which the rooftop represents the main or only air handling and ventilation system. The WSM2 units offers various possibilities in terms of air handling sections, ranging from recirculation only to mixing of fresh air and return ambient air, up to the solution with heat recovery from the exhaust air.

As well as this, each of the different configurations can be further customised thanks to a vast selection of accessories.

3. MAIN CHARACTERISTICS

3.1 Introduction

WSM2 is a packaged reverse-cycle ((WSM2) or cooling only (WSM2-T) air-air unit for air handling and air change in spaces with large surface areas or volumes, such as cinemas, shopping centres, exhibition centres and stores. All models come with a double refrigerant circuit, scroll compressors, electronic expansion valves, R410A refrigerant and EC plug fans for the supply air. The ample freedom available in choosing the direction of air flows, as well as the possibility to customise the units with four types of heat recovery and different air handling sections, make WSM2 the ideal unit for all application contexts.

The range comprises 8 sizes, from 80 to 180 kW (13500 ÷ 30500 m³/h), each available in eight different functions, allowing the unit to be adapted to the specific requirements of the system.

The possibility to reverse the refrigeration cycle, careful sizing of the components and specific design decisions mean the WSM2 units can work continuously across a wide operating range (outside temperatures down to -10°C in heat pump operation and over 48°C in cooling operation). Considerable reductions in compressor power consumption can be achieved using the free cooling/free heating function, as standard on all models apart from the basic version (AR). A wide range of accessories is available to complete the offering. In particular, high-efficiency filters in addition to the standard equipment (class G4), either pocket F7 or F9, or electronic, for high air purity and removal of pollens, fine dust, toner, mould, smog, viruses, bacteria and tobacco smoke.



The unit meets the requirements for seasonal energy efficiency in heating mode ($\eta_{s,h}$) and cooling mode ($\eta_{s,c}$) pursuant to Regulation (EU) 2016/2281, already complying with the limits set for the second tier (in force as of January 1, 2021), thus proving its high performance.

A wide range of accessories is available to complete the offering. In particular, high-efficiency filters in addition to the standard equipment (class G4), either pocket F7 or F9, or electronic, for high air purity and removal of pollens, fine dust, toner, mould, smog, viruses, bacteria and tobacco smoke.

3.2 Plug fan

The WSM2 units are fitted with plug fans with EC brushless motors. These fans differ from traditional centrifugal fans due to absence of the scroll and direct coupling to the motor, thus eliminating energy loss from the belt and pulley transmission. The rotor is realized with high performance composite material that enhances the efficiency and reduces the noise.



This type of technology ensures clear advantages, with installation being simplified based on the parameters set by the user, without needing any flow-rate adjustment during calibration. In addition, fan speed adapts to the characteristics of the system

even when the unit is operating, for example compensating for any variations in flow-rate due to progressive fouling of the filters. The low power consumption of these types of fans can be further reduced by applying the exclusive control logic developed by MEHITS S.p.A. All this means high operating efficiency even for the part involving the fans, traditionally a critical area in terms of running costs.

3.3 Electronic expansion valve as standard

The use of electronic expansion valves brings considerable benefits, especially when load is variable and with different outdoor conditions. Application of the valve on this unit is a result of specific design decisions regarding the refrigerant circuit configuration and optimisation of operation across a range of different operating conditions. The electronic expansion valve is standard on all versions.

3.4. Energy recovery from the exhaust air

MEHITS S.p.A. has always designed efficient units with the aim of reducing energy consumption and therefore energy waste. At the same time, it is important to ensure air quality inside air-conditioned spaces: this is why suitable air change not only increases the well-being of occupants, but is also mandatory by law in the individual member states. Specific European standards apply (for example EN 15251:2007, which combines aspects regarding air quality inside buildings with energy requirements). For most of the year, the air that is discharged from the indoor spaces is in better temperature-humidity conditions than the incoming air from the outside: it is therefore useful to recover energy from the exhaust air before this is discharged. To satisfy this important requirement, the WSM2 units can be configured with three different types of energy recovery on the exhaust air, so as to best adapt to the different needs and climates where they are installed.

These are:



REFRIGERANT BOOSTER: a finned coil is placed next to the exhaust air damper.

This is crossed by the entire exhaust air flow, allowing all of the heat contained in the exhaust air to be recovered. The recovered energy is transferred to the refrigerant circuit, which increases the net cooling effect in the air handling coil without requiring additional compressor work.



PLATE HEAT EXCHANGER: the flow of incoming fresh air, before being mixed with the return air, flows across a plate heat exchanger, where it is either heated or cooled by the exhaust air flow. The two air flows remain completely separate, being in sealed sections between the aluminium plates. Heat is transferred due to the temperature difference between the two air flows.



ROTARY heat recovery: an enthalpy wheel rotates continuously, absorbing the heat and humidity from one of the two air flows and then transferring it to the other. This represents the highest-performance heat recovery unit, with a recovery efficiency of up to 85%.

3.5 AIR 3000 TE advanced controller

All units are fitted with the AIR 3000 TE controller, especially developed by MEHITS S.p.A. for rooftop units. It features a double control board, one for the refrigerant circuit and one for the air treatment, and a liquid crystal display (LCD) on board of all the units.

This keypad accesses a user interface with eighteen European languages available for selection by the user. This allows an interface that's specific for the country where the unit is installed, or alternatively, by setting English, completely independent for all other regions.

Temperature control is performed using algorithms that control available devices (compressors, hot gas reheat coil, heating devices) based on the unit configuration. Control is applied using the return air temperature probe reading, based on proportional or proportional + integral logic. As an alternative also supply temperature control is available. The temperature set point can be set directly on the controller, or managed via a remote digital or analogue contact.

Interfacing to commercially-available BMS systems is provided thanks to compatibility with BACnet, BACnet OverIP, ModBus and LonWorks protocols.

The **built-in clock** provides a daily scheduler function, organized into time bands so as to optimise unit operation, minimizing system energy consumption.

In fact, several time bands (up to 10) of different types (4) can be activated throughout the day, with each band being assigned:

- temperature set point for cooling and heating
- humidity set point
- unit operating modes: control on, off, purging, start-up.

Ventilation, according to unit's configuration, can be managed in the following modes:

- constant air flow (standard operation);
- constant pressure;
- variable air flow.

Other available functions:

- room humidity control in cooling and heating mode;
- automatic temperature- and enthalpy-based free cooling Management;
- self-adaptive defrost management using algorithms that reduce defrost duration or prevent unnecessary or wasteful cycles;
- demand limit on compressors to reduce mains power consumption;
- set point compensation based on outside temperature, in both cooling and heating operation;
- Management of the heating devices as integration or substitution of the heat pump;
- Control and management of the ambient air quality with on board sensors or remote signal;
- Air flow set point management with digital or analog signal;
- Auxiliary controls available through remote contact or directly from the controller: room washing mode, running-up mode, ventilation mode, full fresh air mode.



Display and acquisition of the last 200 alarm events (user level) are also available as well as recording of operating variables in the 10 minutes prior to each alarm event (assistance level through Black Box) with display via PC. Compatibility with remote keypad (management of up to 8 units).

3.6 Simplified installation and maintenance

The WSM2 rooftop units simplify and reduce the costs of maintenance and work on site, through:

- Sturdy and perfectly insulated structure that guarantees resistance to the elements and mechanical stress.
- Easy access to the inside sections and the components that require periodical cleaning, for fast and economical routine maintenance.
- "PLUG and PLAY" construction that ensures, once the unit has been positioned, simpler and faster electrical and air connections.
- Automatic calibration of air flow-rates, with consequent savings in technical service and greater comfort.

3.7 Variable Air Flow

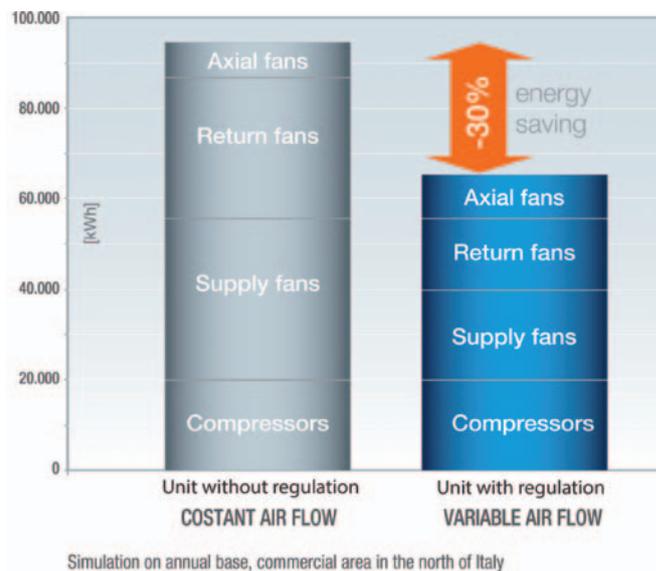
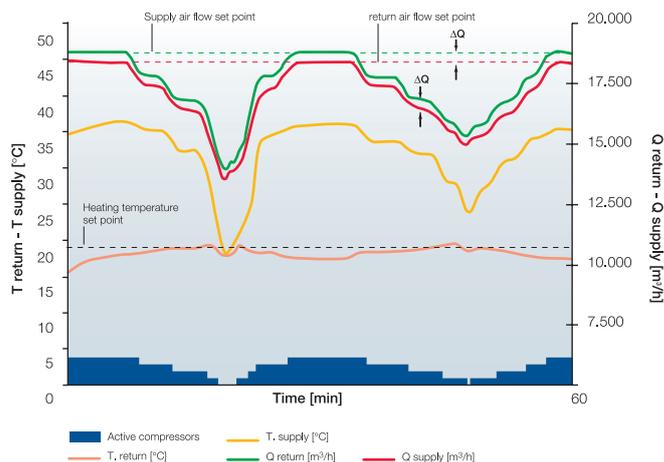
On rooftop units, that directly serve the air-conditioned environment and represent the main source of ventilation, the supply and return fans work continuously at a fixed flow-rate, in all operating conditions, even during freecooling and at part loads, which together account for the majority of operating hours.

Consequently, power consumption from fan operation on rooftop units represents over 50% of total annual unit power consumption, which is why MEHITS S.p.A. decided to develop a system for controlling fans that could reduce fan power consumption.

The most effective way to reduce power consumption is to decrease fan speed, and consequently flow-rate, whenever system operating conditions allow.

The advanced logic featured on the AIR 3000 TE controller and the use of plug fans with electronic speed control have allowed the **Variable Air Flow** function to be developed. This involves changing the supply and return air flow-rate based on effective demand from the system, considering the activation percentage of each device - compressors, heaters or burners, freecooling or freeheating. For example, progressive shutdown of the compressors will bring a reduction in air flow-rate, defined within the limits set by the user.

This means flow-rates are managed based on the actual conditions in the air-conditioned space, while still observing any limits defined on the components and the type of system. In addition to benefits in terms of comfort, there are also economic advantages, as reducing fan speed cuts total unit power consumption by 30% compared to the traditional fixed flow-rate solution.



4. DESCRIPTION OF THE UNIT

4.1 Description

Packaged reverse-cycle (WSM2) or cooling only (WSM2-T) air-cooled rooftop air-conditioner with scroll compressor and R410A refrigerant.

Packaged reverse-cycle (WSM2) or cooling only (WSM2-T) air-cooled rooftop air-conditioner, for air handling, filtration and ventilation, based on the selected configuration.

Structure

Structure designed specifically for outdoor installation, base and load-bearing frame made from suitably thick hot galvanised and painted steel sections. The front of the unit comprising the condenser and the electrical panel is made from galvanised metal panelling, painted with polyester powder coat to ensure complete weather resistance (colour RAL 7035).

The rear of the unit is the air handling section, and comprises a load-bearing structure made completely from aluminium alloy, supporting sandwich panels (thickness 25 mm on the side, 42 mm bottom and top), with galvanised sheet panelling on the inside and painted galvanised sheet (colour RAL 7035) on the outside, with polyurethane foam insulation in between, average density 45 kg/m³.

The resulting structure has the following features:

1. rigidity and sturdiness;
2. continuous gasket on the closing panels in the air handling area for better tightness to air and rainwater;
3. panels closed using special handles that allow them to be opened from the left or right or removed completely, for better access to the unit;
4. the sandwich panels making up the top of the air handling area are in turn fully covered by special coiled metal panelling to prevent water infiltration; this panelling is made from galvanised and painted sheet, colour RAL 7035;
5. the electrical cables and refrigerant piping are positioned in dedicated sections, without crossing through the air handling section.

Any mixing chambers for air return, energy recovery or additional modules are always incorporated into the single packaged structure; the WSM2 unit is therefore a completely plug-and-play solution, minimising the time needed for handling and installation on site.

Compressors

Hermetic rotary scroll compressors, R410A refrigerant, fitted with timed sump heater (automatically deactivated when not needed) and a two-pole electric motor with direct starting, internally protected against excess temperature.

Indoor heat exchanger

Direct expansion air handling coil for heat exchange with the refrigerant gas, made from a coil of mechanically expanded copper tubes and corrugated aluminium fins.

The speed of the air through the coil is kept below the limit value of 2.7 m/s, even at full flow, to avoid entraining condensate, even in the most extreme temperature-humidity conditions.

Aluminium basin for collecting condensate, with sloping bottom and complete with drain attachment.

Outdoor heat exchanger

Direct expansion outdoor coil for heat exchange between the refrigerant gas and the outside air, made from a coil of mechanically expanded copper tubes and corrugated aluminium. Each circuit has its own dedicated and independent condensing coil. The coils are protected by galvanised and painted metal grills in the same colour as the panelling.

For WSM2 reverse-cycle units, each coil is equipped with a heater to prevent ice from forming after defrosting in winter operation.

Accessory. Refrigerant Booster heat exchanger (reference function HR-B)

Additional coil for heat exchange between the refrigerant gas and the exhaust air, made from a coil of mechanically expanded copper tubes and corrugated aluminium fins. The coil is installed at the air exhaust damper.

Accessory. Cross-flow heat recovery (reference function HR-P)

Aluminum plate heat exchanger, made of flat surfaces with swirlers at variable spacing, without moving parts. Appropriate seals keep the air flows separated. The recovery transfers the energy from the high temperature flow to the low temperature one, thanks to a cross flow operation.

Two versions of plate heat exchanger are available for energy recovery: the first version (LOW FLOW) can handle up to 50% of the flow-rate delivered by the supply fans, recommended for all applications with medium occupancy.

For higher air change requirements, the HIGH FLOW version features larger plates, and can handle from 50% to 100% of the total flow-rate passing through the indoor direct expansion coil.

Accessory. Heat recovery with enthalpy wheel (reference function HR-E)

Energy recovery system on the exhaust air, made up of a high efficiency enthalpy wheel consisting of alternating flat and corrugated aluminium sheets, with hygroscopic treatment, so as to create a series of passageways in the opposing directions to the flows of fresh and exhaust air. The wheel is driven by an electric motor at constant speed with very low power consumption. Both sensible and latent energy is recovered: this limits the introduction of moisture into the room during summer and increases humidity in winter.

Refrigerant circuit

The unit has double refrigerant circuit comprising, in addition to the above:

- R410A refrigerant charge
- filter-drier
- liquid flow indicator
- bi-directional electronic expansion valve
- charge and pressure control valves
- double pressure switch in series to control high pressure in the refrigerant circuit
- low pressure safety valve
- non-return valve
- four-way reversing valve (WSM2 only)
- liquid receivers at condenser outlet (WSM2 only)

Supply plug fan section (standard)

Plug fans on the supply air with brushless EC motors. Impeller with backward inclined blades made from composite material, with three-dimensional airfoil profile optimised for high efficiency and low noise levels. Directly-coupled EC motor (with integrated controller specifically calibrated for the fan), IP54 ingress protection and integrated thermal protection, allowing continuous and precise air flow control.

Accessory. Exhaust air fan

If the unit is equipped with the accessory AX function, it is fitted with one or more axial-flow fans to help discharge the exhaust air from the air-conditioned space. Die-cast aluminium axial-flow

airfoil fan, directly coupled, with external impeller. These are fitted with special diffusers to recover the residual kinetic energy from the supply air, converting this into static energy. Consequently, for the same air flow-rate there is lower power consumption and less noise produced.

The electric motor is fitted with built-in thermal protector. Motor ingress protection IP54, insulation class F.

Accessory. Return plug fan section

If the unit is fitted with the CE, HR-B, HR-P (low flow and high flow) and HR-E accessory functions, similar EC plug fans (with integrated controller specifically calibrated for the fan) to those used on the supply air are fitted for the return air from the air-conditioned space. These fans are installed inside the air handling chamber at the rear.

Outdoor fans

Wing shaped axial fans in die-cast aluminium, directly coupled, with external impeller.

The electric motor is fitted with built-in thermal protector and self-supporting protective mesh on the outside. Motor ingress protection IP54, insulation class F.

Separate ventilation for each circuit, with the fans in the inactive circuit switched off. Fan speed control via autotransformer as standard for all units.

For finer control, less power consumption and lower noise, the external axial-flow fans are available in the EC version (option 865).

Filtration

Pleated synthetic fibre pre-filter, grade G4, 98 mm thick at the air inlet.

The filters are positioned on steel guides with easy access for routine maintenance and replacement.

Following system commissioning, the filters should be replaced to eliminate any trapped impurities.

Power and control electrical panel

Power and control electrical panel built in compliance with EN60204-1 and IEC204-1, complete with:

- Control circuit transformer
- Main door lock disconnect switch
- Power section with busbars
- Compressor and fan circuit breakers
- Spring-loaded terminals on the control circuits
- Electrical panel for outdoor installation, made from hot galvanised and painted panels and complete with gaskets
- Electric heaters on outdoor coils (WSM2 only)
- AIR 3000 TE microprocessor-based electronic controller
- Operator panel with LCD interface.
- Compressor sump heaters with timer

Unit power supply voltage: 400V~ ±10% - 50Hz.

Electric panel is supplied as standard with two air grills with filter and a flexible duct that connect supply air treatment side with the electric panel. In this way, electrical panel is cooled during summer and heated in winter time, reducing the problem of condensation on electrical device.

4.2 AIR 3000 TE controller

The AIR3000 TE controller offers advanced functions and algorithms. It is made up by two control boards, dedicated to the air side and the refrigerant side respectively. The keypad features functional controls and a complete LCD display that allows for the monitoring and intervention on the unit by means of a multi-level menu with selectable user's language.

It can be used to set the unit start-up and ambient washing function, as well as to set unit the operating mode (manual heating or cooling, automatic changeover).

Temperature control is based on proportional or proportional + integral logic using the return air temperature probe reading; the set point can also be adjusted based on the outside temperature, in both cooling and heating mode.

For units fitted with motorised outside air damper, the controller automatically manages free cooling operation based on the outside air temperature; optionally, free cooling can also be managed based on enthalpy.

The ventilation section can work at constant flow-rate (standard) or variable flow-rate, at constant pressure (optional).

The controller can also integrate and automatically manage different optional heating devices (hot water coil, electric heater and built-in gas-fired heating module), hot gas post-heating (optional) and percentage of fresh air (optional via CO₂ probe or remote 4-20 mA signal).

Defrosts use proprietary self-adaptive logic involving monitoring of multiple operating and climate parameters.

This reduces the number and duration of defrosts, consequently increasing overall energy efficiency.

Compressor power consumption can be controlled using a demand limit function (optional), while an unloading function is available for part-load operation of the refrigerant circuit in critical conditions (HPTC function), which involves both the compressors and the outside air intake damper (where fitted).

In critical conditions (high outside temperatures), this function switches off one of the two tandem compressors in the refrigerant circuit and progressively closes the outside air intake damper, thus at least partly providing the required cooling capacity.

Supervision is available with different options, using proprietary devices or by integration into third party systems using ModBus, BACnet, BACnet-over-IP and Echelon LonWorks protocols.

Compatibility with remote keypad (management of up to 10 units). The timer can be used to create an operating profile with up to 4 typical days and 8 different time bands.

4.3 Certification

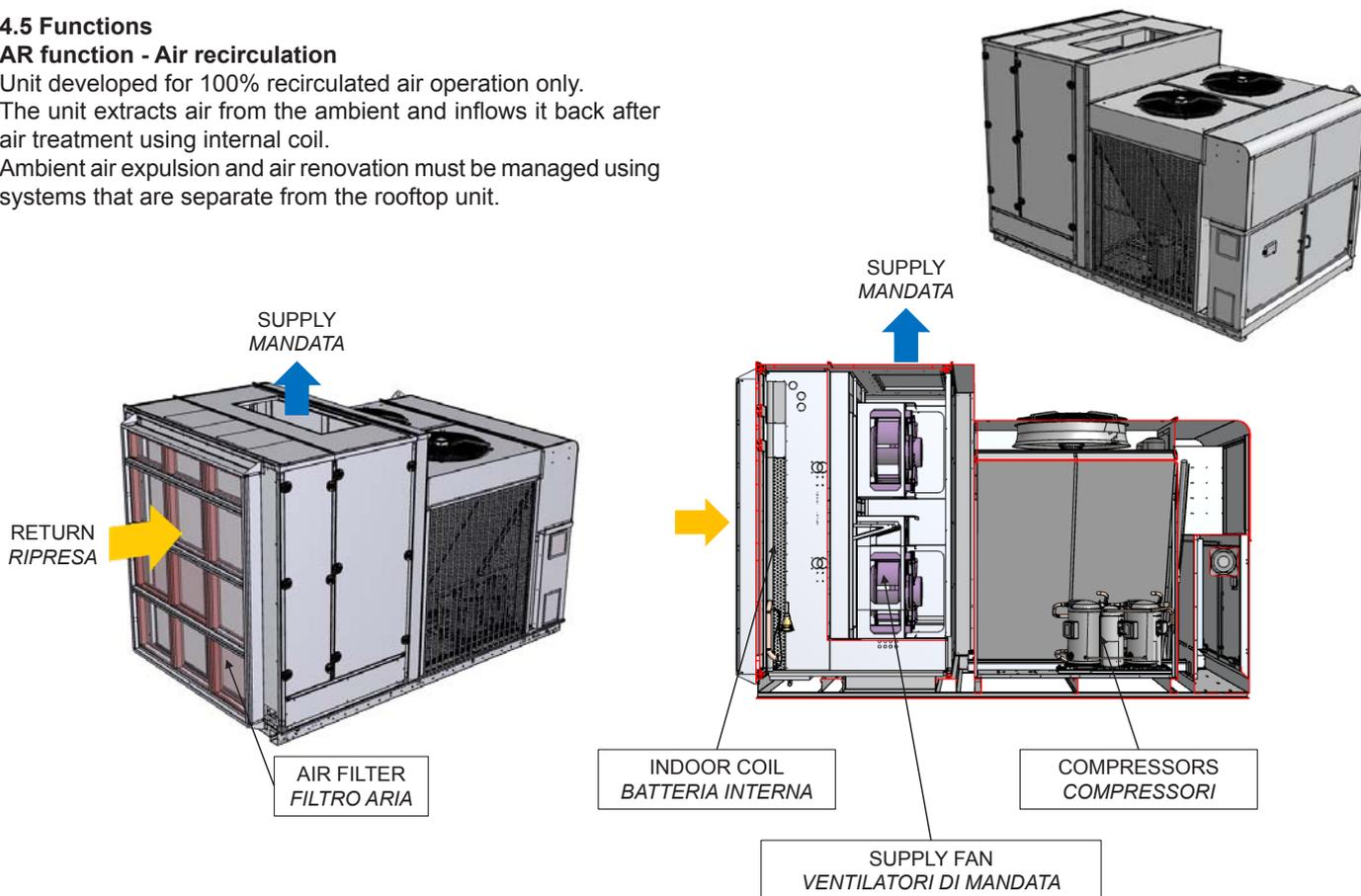
Unit compliant with the following directives and amendments:

- Machinery directive 2006/42/EC.
- Electromagnetic compatibility directive 2014/30/EC.
- Pressure equipment directive 2014/68/EU
- Low voltage directive 2014/35/EC.
- Gas appliances directive 2009/142/EC (where applicable)
- Regulation (EU) 2016/2281 (implementation of directive 2009/125/EC) second Tier (ErP 2021)

4.5 Functions

AR function - Air recirculation

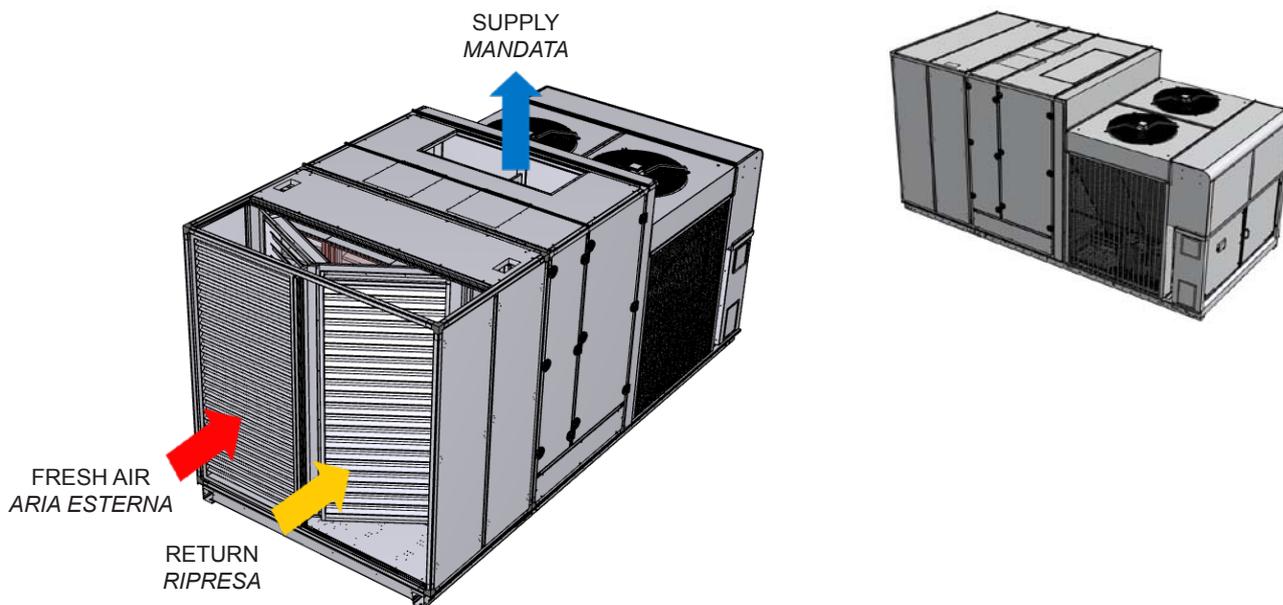
Unit developed for 100% recirculated air operation only. The unit extracts air from the ambient and inflows it back after air treatment using internal coil. Ambient air expulsion and air renovation must be managed using systems that are separate from the rooftop unit.



Opt. 1072 - MF function - Mixing and Free cooling

Compared to the basic version, the unit features two opposing motorised dampers managed by the unit's controller so as to allow operation with 100% recirculated air, mixtures and free cooling. This function allows the recirculated ambient air to be mixed with some fresh outside air, either at a fixed percentage set on the controller, or using an air quality probe (CO₂ reading). Free cooling operation is managed by the controller, which opens the dampers so as to create a mixture of fresh outside air and recirculated air that requires less energy for the treatment,

depending on the outside temperature, indoor temperature and set point. During this function one or more cooling devices are disconnected, and are completely switched off with 100% free cooling operation. The supply fans guarantee rated air flow; ambient air expulsion must be managed using systems that are separate from the rooftop unit. This function should be chosen when the amount of fresh outside air to be introduced into the spaces is quite low, pressure drop in the return ducts is also low and the building is not particularly airtight (older constructions).



Opt. 1073 - AX function - Axial Fan for Extraction Mixture and exhaust with axial-flow fan

Compared to the basic version, the unit features two opposing motorised dampers managed by the unit's controller so as to allow operation with 100% recirculated air, mixtures and free cooling.

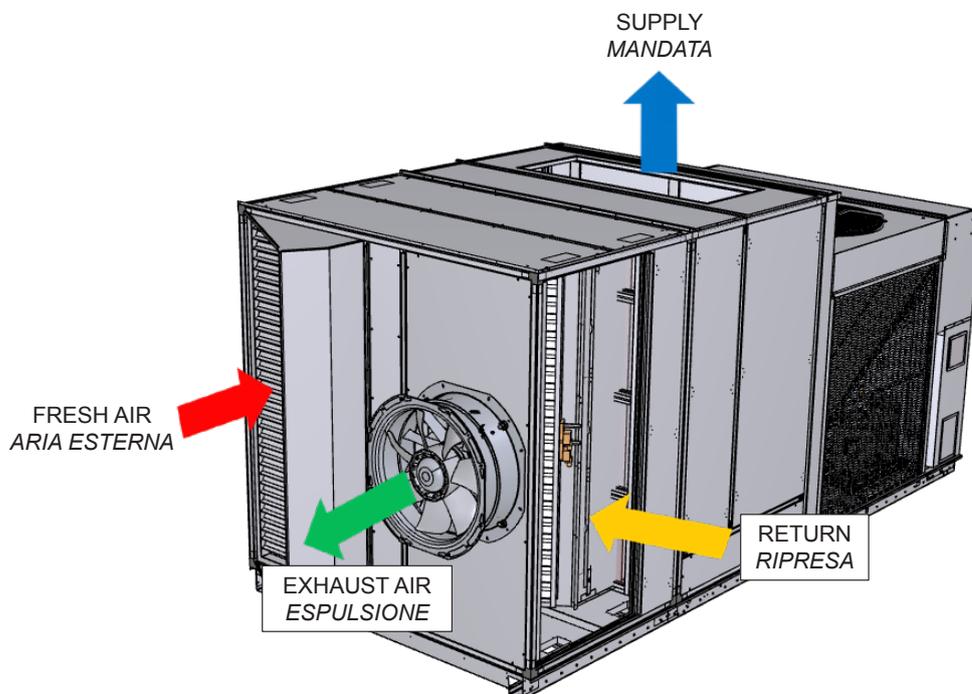
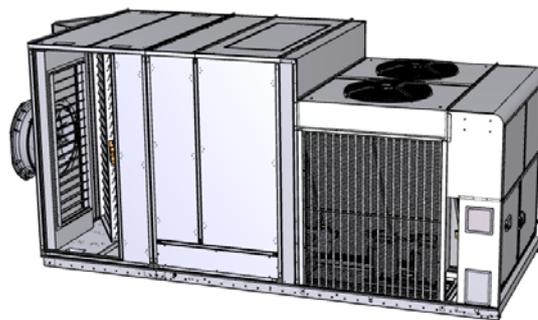
This function allows the recirculated air taken from the rooms to be mixed with some fresh outside air, either at a fixed percentage set on the controller, or using an air quality probe (CO₂ reading). Free cooling operation is managed by the controller, which opens the dampers so as to create a mixture of fresh outside air and recirculated air that requires less energy to air-condition, based on the outside temperature, indoor temperature and set point. During this function one or more cooling devices are deactivated, and are completely switched off with 100% free cooling operation. The supply fans guarantee the design flow-rate.

A barometric damper is fitted on the exhaust air flow so as to minimise the overpressure in the building caused by the introduction of fresh outside air. This damper guarantees quite good control of indoor pressure when introducing small percentages of outside air (up to around 20% of total air flow).

To assist the discharge of exhaust air with higher outside air intake flow-rates (up to 35% of total air flow), one or more axial-flow fans are fitted downstream of the barometric damper, and switch on when the amount of outside air introduced exceeds a certain set value. With reference to the exhaust air flow-rate, these fans can overcome quite high pressure drop in the return air duct, up to 150 Pa.

A special device controls the exhaust air fan speed based on the opening percentage of the damper that controls outside air intake.

This type of unit is suitable for all small-medium commercial premises in reasonably airtight buildings, such as supermarkets, shops and service stations.

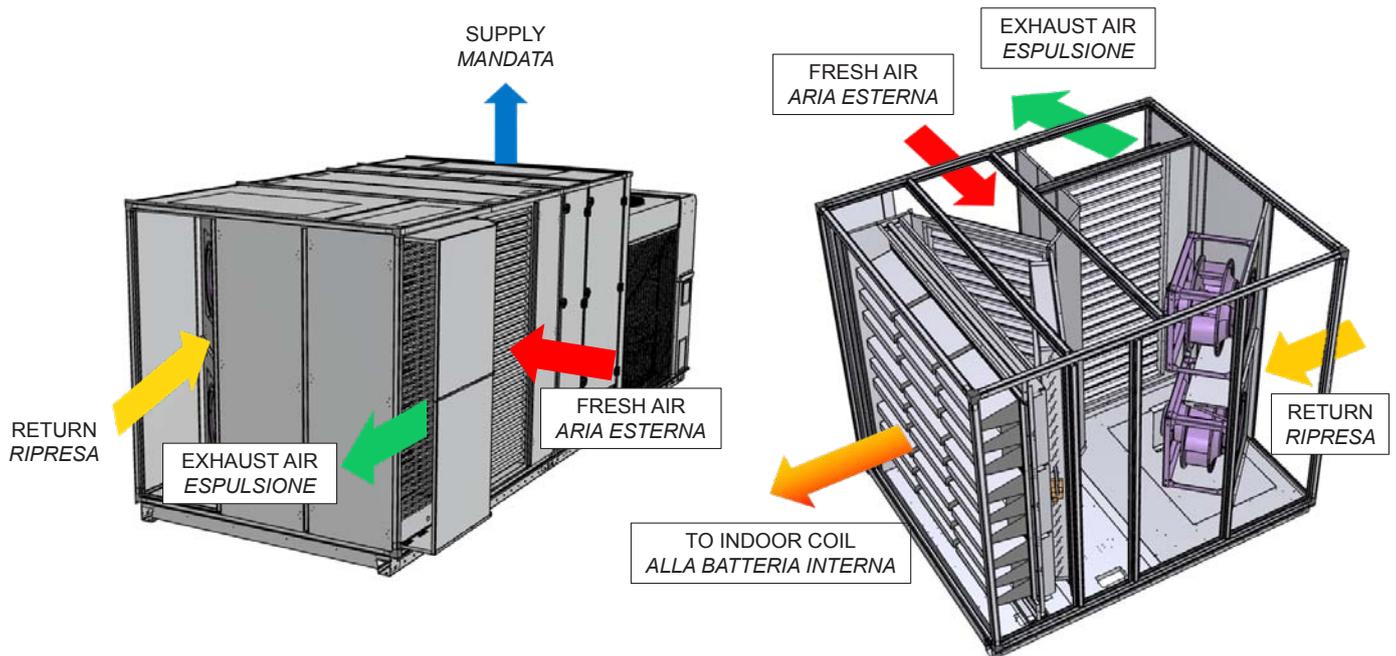
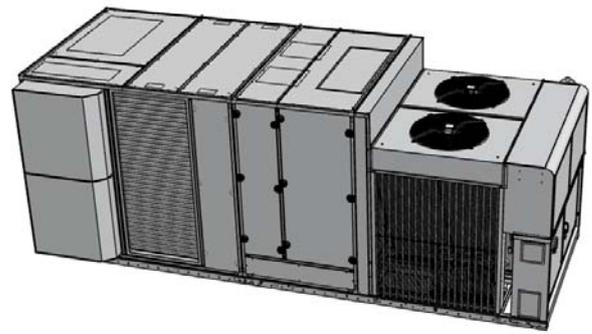


Opt. 1074A - CE function - Centrifugal extraction/expulsion

Unit with three motorised dampers managed by the unit's controller for operation with 100% recirculated air, mixing, free cooling and air extraction/expulsion. This function allows the recirculated ambient air to be mixed with some fresh outside air, either at a fixed percentage set on the controller, or using an air quality probe (CO₂ reading).

Free cooling operation is managed by the controller, which opens the dampers so as to create a mixture of fresh outside air and recirculated air that requires less energy for the treatment, depending on the outside temperature, indoor temperature and set point. During this function one or more cooling devices are disconnected, and are completely switched off with 100% free cooling operation.

The supply fans guarantee rated air flow, the return fans (also EC plug fans) draw in air from air-conditioned rooms and discharge the excess exhaust air.



Opt. 1075 - HR-B Function - Return air fan and Refrigerant Booster heat recovery

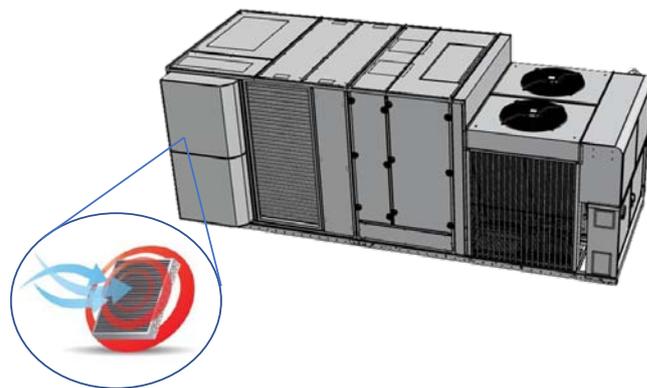
The WSM2/HR-B units are fitted with the exclusive Refrigerant Booster heat recovery system, which completely recovers heat from the exhaust air.

This recovered energy is transferred to the refrigerant circuit, which increases the capacity of the air handling coil without increasing compressor workload.

The recovery unit uses a finned coil installed at the air exhaust damper. The latter handles the entire air flow with uniform distribution.

In cooling operation, the favourable conditions of the exhaust air can be exploited to increase liquid subcooling.

In heating operation, on the other hand, the heat recovery coil contributes to the evaporation stage, meaning less work is needed by the outdoor coils and the refrigerant circuit can operate at more advantageous evaporating temperatures.



Benefits

- Complete and precise recovery of the energy contained in the exhaust air, ensured by perfect distribution across the heat recovery coil without mixing with outside air.
- Increased cooling and heating capacity delivered by the entire unit.
- The additional heat exchanger coil in the refrigerant circuit means an overall reduction in compressor power consumption
- Complete separation of the air flows
- Additional air pressure drop is limited solely to the exhaust air flow.
- Ideal solution for Mediterranean climates with mild winters, as the energy in the exhaust air can also be exploited in conditions that traditional air/air heat recovery units would otherwise not allow.

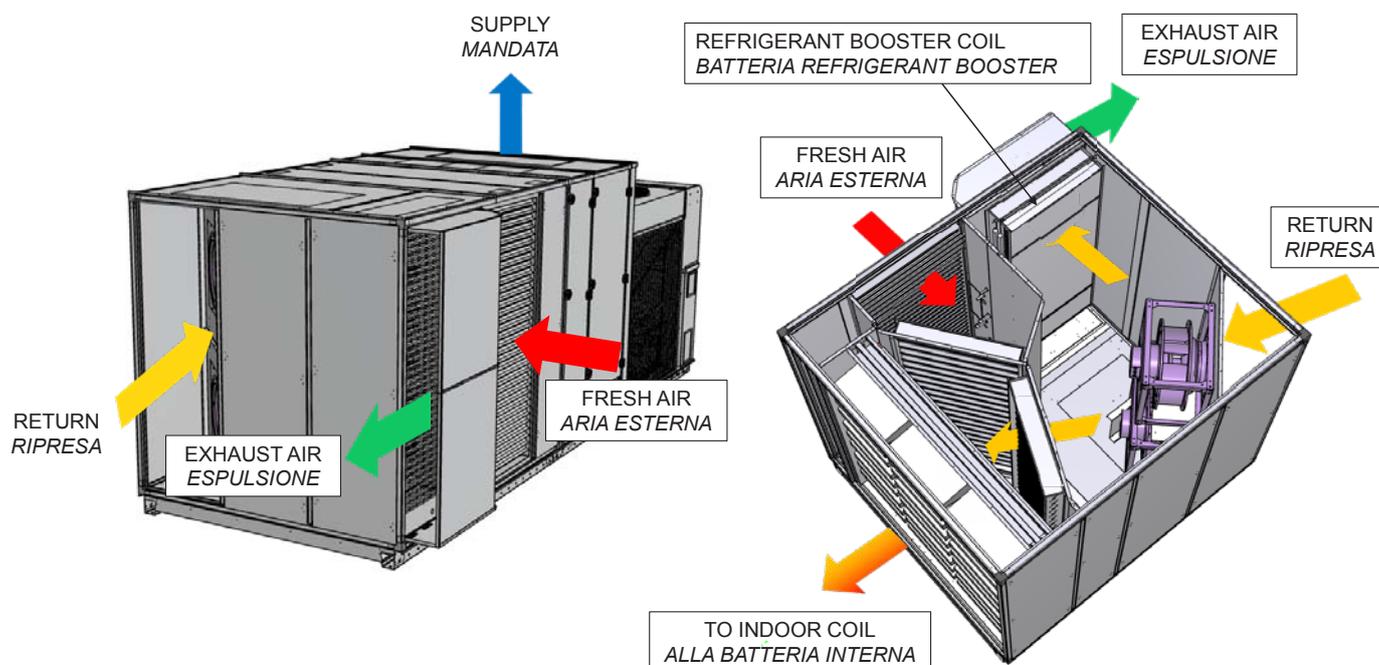
Technical solution

Compared to the basic version (AR), the HR-B function features a mixing chamber with three dampers, a section containing the EC plug fans for the return air, and the Refrigerant Booster recovery coil located near the exhaust air damper.

The return air fans can overcome considerable pressure drop in the duct (even higher than 250 Pa 250 Pa)

with high air flow-rates, for precise control of overpressure in the air-conditioned space.

This function is useful in new buildings with high air change requirements (such as cinemas, theatres, auditoriums, exhibition centres and shopping centres).

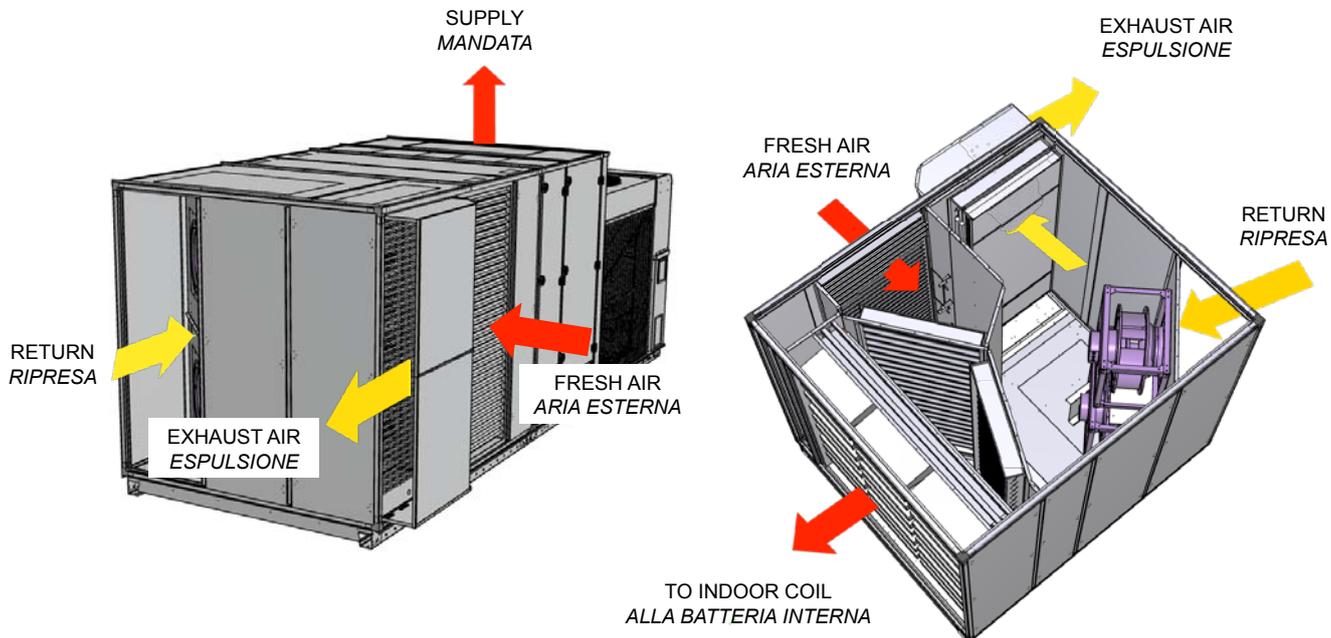


Free cooling operation

During operation in free cooling mode, there is an initial condition in which the outside temperature is not low enough for the heat inside the air-conditioned space to be rejected (e.g. Troom 26 °C and Tout 23°C), and consequently the refrigerant circuit needs to operate at part load to ensure the desired conditions (partial free cooling or free heating).

When operating, the circuit continues to exploit the Refrigerant Booster effect, maximising efficiency and reducing compressor running time.

When the outdoor conditions allow, the outside air intake damper is fully opened, while the recirculation damper is closed, allowing 100% free cooling operation.



Opt. 1076 -1077 - HR-P Function - Return air fan and heat recovery with plate heat exchanger

WSM2 units are available also with plate heat recovery, suitable for installation in cold or extremely hot regions. It allows to transfer the energy of the exhaust air to the fresh air flow. The cross flow heat recovery allows also to extend the working limits of the unit and to operate with high air flows.

Operating principle

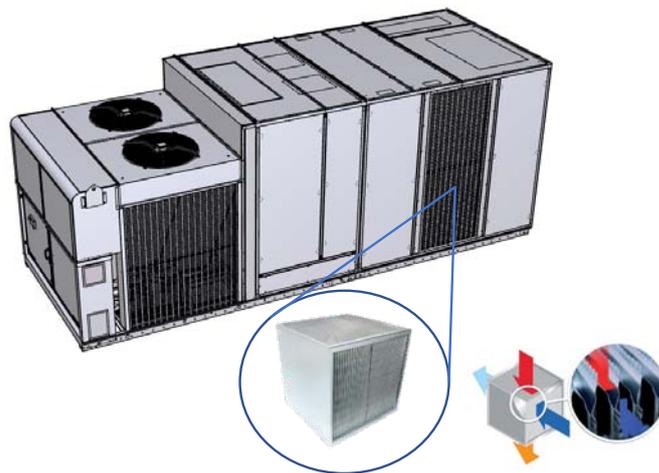
The exhaust air flow heats or cools the fresh air one, before mixing with return air, through the plates of the heat recovery.

The two air flows are completely separated thanks to appropriate seals and the heat transfer is realized thanks to the temperature difference between the two air flows.

The efficiency of energy recovery increases the higher the temperature difference between the two air flows, making this solution particularly suitable in extreme climates.

Benefits:

- Complete separation of the air flows
- No contamination between the two air streams (exhaust and fresh air)
- High reliability and safe operation
- Easy cleaning and minimum maintenance
- Optimum performance in extreme climates
- Extends unit operating limits
- Suitable for operation with high outside air flow-rates (even 100% in some sizes/versions)
- Aluminium construction to increase heat exchange
- Low pressure drop ensured by the large heat exchange surfaces



Technical solution

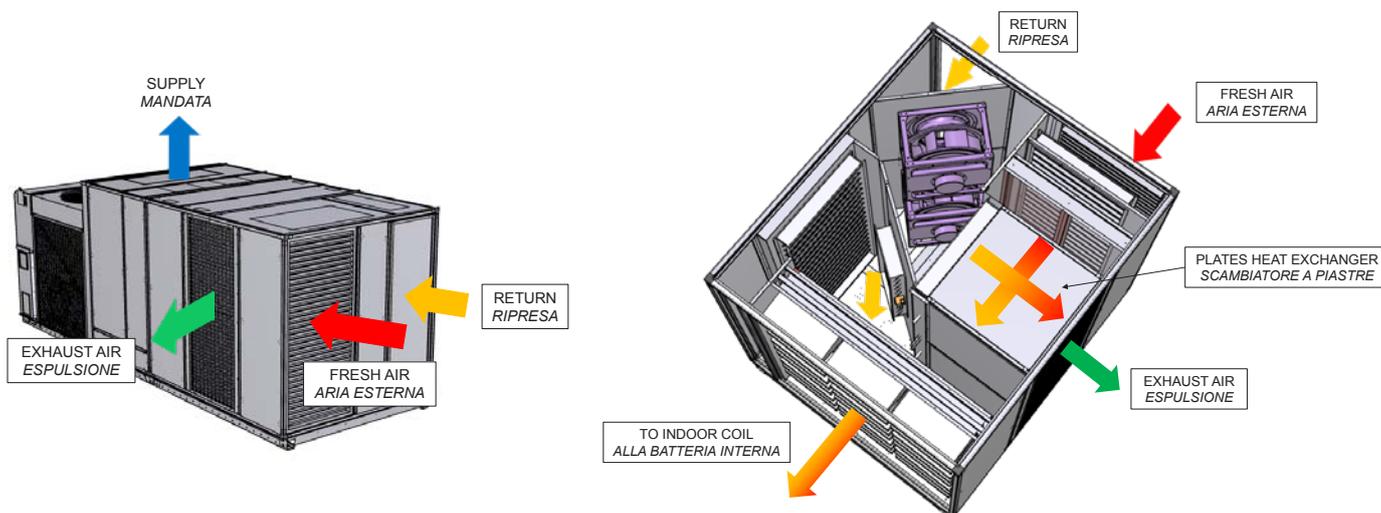
Compared to the CE version, the HR-P function uses a plate heat exchanger for heat recovery between the outside air intake and exhaust air.

The heat recovery unit is installed inside the three-damper mixing chamber, located upstream of the air handling coil and that also contains the return fans (EC plug fans).

This function is useful in new buildings with high air change requirements (such as cinemas, theatres, auditoriums, exhibition centres and shopping centres).

Two versions of plate heat exchanger are available.

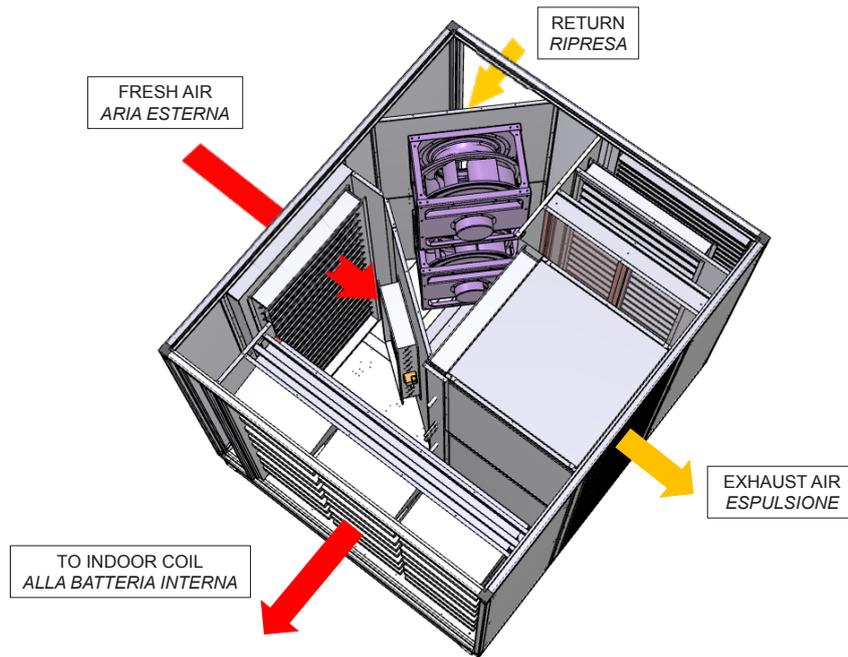
For systems where the outside air intake flow-rate is normally less than 50% of supply air flow-rate, the low air flow version is suitable (opt. 1076 – low flow); vice-versa if the outside air flow-rate is predominant, a version is available featuring a heat exchanger with larger plates (option 1077 - high flow). Both solutions feature additional filters to protect the heat exchanger from excessive fouling: in particular, class G4 filters are installed in the outside air flow.



Free cooling operation

To reduce system pressure drop when the temperature conditions are not favourable for heat recovery, the unit is fitted with dampers for operation in free cooling mode. In particular, in total (or partial) free cooling operation, all (or part) of the air returning

from the air-conditioned space does not flow through the plate heat exchanger, but rather is discharged to the outside via a damper located on one side of the return air ventilation section; as well as discharging the air.



Opt. 1079 - HR-E function - Return air fan and heat recovery with enthalpy wheel

An enthalpy wheel is the most efficient form of heat recovery, with efficiency between 60% and 90% depending on operating conditions, allowing compliance with standards in force regarding energy savings.

The enthalpy wheel is made from an alternating sequence of flat and corrugated aluminium plates that create a very high heat exchange surface area in relation to the volume, achieving benefits also in terms of the space occupied inside the unit. The hygroscopic treatment that the aluminium plates undergo allows recovery of both latent heat and sensible heat, reducing the introduction of moisture in summer and minimising if not totally eliminating the need for humidifiers in winter, significantly increasing overall unit performance.

Operating principle

On a rotary heat recovery unit, heat exchange occurs through accumulation of heat in the wheel. Heat is transferred to the heat-absorbing material from the exhaust air in one half of the rotation. The heat is then given up to the fresh outside air in the other half of the rotation. As the wheel rotates, the parts that absorb and give up heat are continuously inverted. The wheel is driven by a fixed-speed motor.

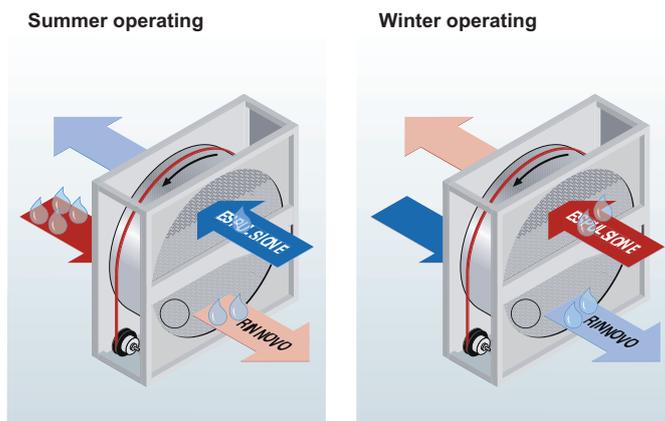
Benefits:

- Complete separation of the air flows
- High heat recovery efficiency
- Recovery of latent heat
- Optimum performance in extreme climates
- Extends unit operating limits
- Suitable for operation with high outside air flow-rates (even 100% in some sizes/versions)
- Heat recovery can be bypassed during free cooling operation using the outside air intake and exhaust air dampers, consequently reducing the energy consumption of the supply and return air fans.

Technical solution

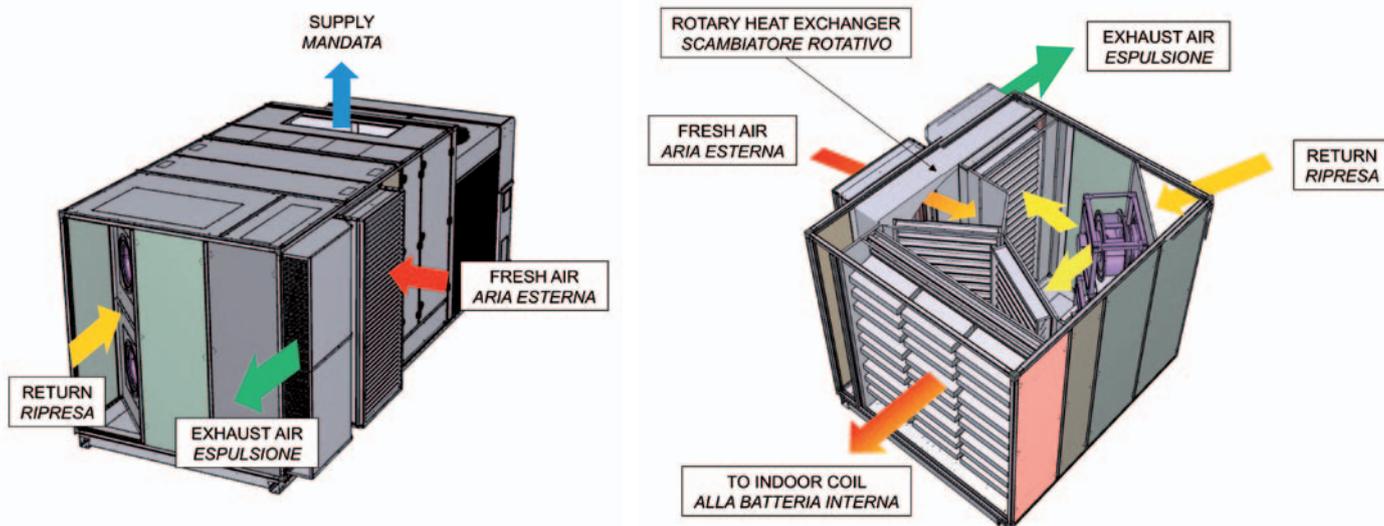
Compared to the CE version, the HR-E function uses an enthalpy wheel to recover sensible and latent heat between the fresh outside air and exhaust air.

The heat recovery unit is installed inside the three-damper mixing chamber, located upstream of the air handling coil and that also contains the return fans (EC plug fans).



This function is useful in new buildings with high air change requirements (such as cinemas, theatres, auditoriums, exhibition centres and shopping centres).

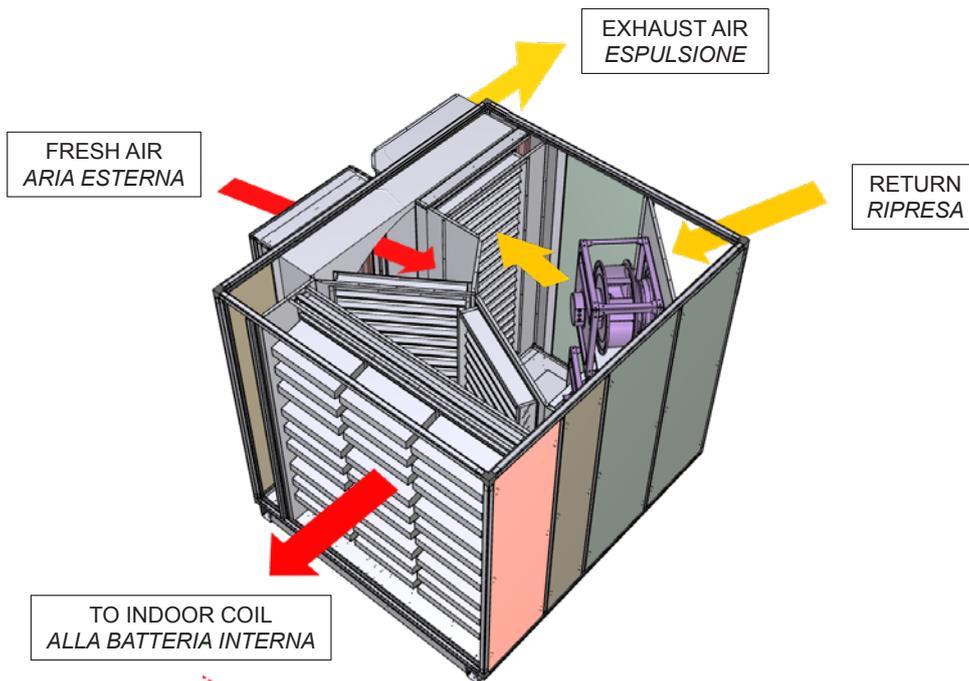
Additional filters are fitted to protect the heat exchanger from excessive fouling: in particular, class G4 filters are installed in the outside air flow.



Free cooling operation

This function is enabled when the temperature or enthalpy (optional) conditions of the outside air allow. In total free cooling operation, the motor that drives the enthalpy wheel is stopped, so as to stop heat and latent energy exchange

between the two air streams. The unit can work at up to 100% free cooling (i.e. the flow rate is equivalent to the total flow of outside air).



4.6 Remote keypad

The unit's display is located on the electrical panel door and is connected directly to the AIR3000 TE controller.

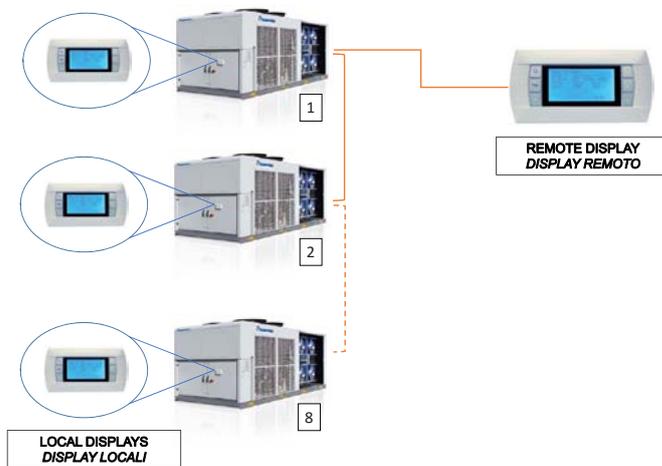
The unit can also be connected to a remote keypad, choosing between different configurations.

Code C9261063. Remote keypad kit up to 200 m (K200), being the distance between the last unit and the remote keypad. The kit includes a second keypad/display and two "T" junction boards: one to be fitted near the controller, the other near the remote keypad.

Code C9261064. Remote keypad kit up to 500 m (K500), being the distance between the last unit and the remote keypad. The kit includes a second keypad/display and two "T" junction boards: one to be fitted near the first controller in the LAN, the other near the remote keypad. The kit also includes an AC/DC power supply for the remote keypad, to be placed near the keypad.

The maximum length possible is 500 m.

The same remote keypad can display up to 8 rooftop units, exploiting the LAN connection between the units. After having correctly completed the connections, the remote keypad can switch from interfacing to one unit to the next, following the procedure shown in the user manual.



5. ACCESSORIES

CODE	ACCESSORY NAME	DESCRIPTION	ADVANTAGES
1062	Unit ErP 2021 Compliant	This indicates that the unit complies with the minimum seasonal energy efficiency requirements for space heating and cooling specified in EU regulation 2016/2281	The unit fully respect the compatibility directives required for the CE mark, including new efficiency limits in force since January 1st, 2021
2070	Supply air	The supply air flow direction can be chosen among lateral (right), from the bottom the rear or the top. Check compatibility with some accesories and functions on the table reported in this technical bulletin	The installation of the unit and the ducts are significantly simplified.
2060	Return air	The return air flow direction can be chosen among lateral (left), from the bottom, the rear or the top. Check compatibility with some accesories and functions on the table reported in this technical bulletin	The installation of the unit and the ducts are significantly simplified.
2411	Remote phase-sequence control	Relay for controlling the phasesequence of mains.	Protects loads against faults due to incorrect connection of the electric line.
3412	Automatic circuit breakers	Over-current switch on the major electrical loads.	In case of overcurrent allows resetting of the switch without the replacement of relative fuses.
3301	Power factor correction	Capacitors on the compressors' power inlet line. For the combination with option 1511 (soft start), contact the office.	The unit's average cos(phi) increases from an average value of 0,87 to a value (average) of 0,92.
4181	ModBUS connectivity	Interface module for ModBUS protocols	Allows integration with BMS operating with ModBUS protocol
4182	Echelon connectivity	Interface module for Echelon systems	Allows integration with BMS operating with LonWorks protocol
4184	BACnet connectivity	Interface module for BACnet protocols	Allows integration with BMS operating with BACnet protocol
4185	BACnet OVER IP connectivity	Interface module for BACnet OVER-IP	Allows to interconnect BACnet devices over Internet protocol within wide-area networks
862	Variable step speed condensing control device	System for the management of external axial fans. It consists of an electrical transformer to manage the air flow at 3 fixed speed values according to the condensing temperature.	When the unit is working at low external air temperatures, the uniform reduction of airflow over the entire surface of the coil offers accurate control of condensing pressure and decreases the overall noise level of the unit.
865	EC Axial Outdoor fans	Electronically commutated fans (EC fans). The brushless motor, governed by a special controller, continuously adjust fans' speed."	"Reduced energy consumption and
1511	Soft start	Electronic device adopted to manage the inrush current. For the combination with option 3301 (compressor phase-shifting) contact the office.	Break down of the inrush current compared to the direct motor start, lower motor windings' mechanical wear, avoidance of mains voltage fluctuations during starting, favourable sizing for the electrical system.
4250	Supply fan uprated motor	Increment of the motor electrical power of the supply fans	Increment of the static available pressure at the supply fans outlet
4240	Return fan uprated motor	Increment of the motor electrical power of the return fans	Increment of the static available pressure at the return fans inlet
1861	Costant air flow regulation + Vair	The unit can manage the air flow set point, both on supply and return, according to the actual load of the resources.	The reduction of the air flow according to the actual load of the system allows to achieve considerable savings and to increase the efficiency.
1862	Costant air flow regulation	Air fan speed is regulated in order to maintain costant air flow valure.	As pressure drop varies, the fans adjust the speed so as to maintain flow-rate at the design value for the system, regardless of how dirty the filters are. We raccomend to select this option together with Filters differential pressure switch.
1863	Costant pressure regulation	Air fan speed is regulated in order to maintain costant static available pressure value.	

CODE	ACCESSORY NAME	DESCRIPTION	ADVANTAGES
1864	Fixed speed 0-10V	Air fan speed is maintained constant at a fixed value set on display	The fan speed can be set directly in the controller in order to reduce start up procedure.
4401	Return fans double set point	It is possible to choose a second return fan set point value, different from that normally set and choose with whom to work via a digital input (set point = could be a fixed air flow or a static pressure or a fixed speed, according to what has been chosen among options 1862-1863-1864). This option is not available with Vair option (1861)	
4402	Return fans continuous set point variation	Return fan set point variation is managed through analog input; the set point varies between a minimum and a maximum values previously fixed via unit display (set point = could be a fixed air flow or a static pressure, according to what has been chosen among options 1862-1863-1864). This option is not available with Vair option (1861)	
4411	Supply fans double set point	It is possible to choose a second supply fan set point value, different from that normally set and choose with whom to work via a digital input (set point = could be a fixed air flow or a static pressure or a fixed speed, according to what has been chosen among options 1862-1863-1864). This option is not available with Vair option (1861)	
4412	Supply+return fans double set point	Digital input for remote set point variation for the supply and return fans (the set point can be either an air flow-rate, a fixed speed or pressure value, depending on the option chosen, 1862-1863-1864). This option is not possible with the Vair option (1861)	
4413	Supply fans continuous set point variation	Supply fan set point variation is managed through analog input; the set point varies between a minimum and a maximum values previously fixed via unit display (set point = could be a fixed air flow or a static pressure, according to what has been chosen among options 1862-1863-1864). This option is not available with Vair option (1861)	
4414	Supply+return fans continuous set point variation	Analogue input for continuous remote variation of the set point for the supply and return fans, within a range previously set on the display (the set point can be either an air flow-rate, a fixed speed or pressure value, depending on the option chosen, 1862-1863-1864). This option is not possible with the Vair option (1861)	
4415	Supply/return fan CO set point regulation	Ventilation set point variation is activated through CO air quality probe, means according to the environment crowding. It can be chose whether to drive or supply fan or return one or both directed, via the sensor	Means that fan set point varies according to the environment crowding.

CODE	ACCESSORY NAME	DESCRIPTION	ADVANTAGES
4415	Supply/return fan CO set point regulation	Ventilation set point variation is activated through CO and VOC (Volatile Organic Compound) . It can be chose whether to drive or supply fan or return one or both directed, via the sensor	Means that fan set point varies according to the environment crowding and VOC pollution.
4141	CO air quality probe"	Used to manage air quality inside the building. The signal is processed by the control unit in order to adjust the external air intake	Automatic management of the fresh air flow-rate allows outside air to be handled only when needed, guaranteeing compliance with relevant standards and occupant comfort.
4142	External forcing 4-20 mA	Remote forcing with 4-20 mA signal to manage the dampers for air renewal	
4143	CO + VOC air quality probe"	Used to manage air quality inside buildings featuring volatile organic compounds (VOC), like solvents, glues, paints. The signal is processed by the control unit in order to adjust the external air intake	The automatic management of the air renewal allows to treat the external air only when necessary, granting compliance with personal wellbeing regulations
2526	High efficiency panel filters, F7	Available in addition to standard filters, they are made from F7 efficiency fibreglass paper and are Class 1 fire resistant. The large inspection panels and steel guides make them easy to remove for cleaning or replacement.	Mounted on the treatment coil inlet, they ensure that the air effectively introduced into the room is filtered.
2521A	High efficiency plate filters, F9	Available in addition to standard filters, they are made from F9 efficiency fibreglass paper and are Class 1 fire resistant. The large inspection panels and steel guides make them easy to remove for cleaning or replacement.	Mounted on the treatment coil inlet, they ensure that the air effectively introduced into the room is filtered.
2524	Electronic filters	Fitted at the coil inlet and used instead of mechanical filtration (F7/F9). The electrostatic precipitation process, lying at the heart of the operating principle, comprises three main stages: electrically charging the airborne particles; capturing the particles; removing the captured particles. The particles are electrified by a discharge ionising device.	Used in high-efficiency applications (yields of 99%) to trap dust particles as small as one micrometre in diameter. Featuring very low pressure drops, they also save ventilating power. Electrostatic filters are designed for long service life and very low maintenance requirements, apart from routine cleaning which is automatically indicated by the filters. They also remove harmful pathogenic agents. High efficiency combined with a long service life allows the initial cost of the investment to be amortised by the extremely low management and running costs.
1852	Filters differential pressure switch	Differential air pressure switch to detect filters' obstruction, with warning	
4311	Empty box	A module (length 650mm) that has to be added when high efficiency filters are required in a AR function unit.	
1461	Hot gas coil with ON/OFF management	Condensing finned coil, installed downstream the treatment coil, fed by hot gas coming from the compressor's supply, with on-off management. For a correct functioning, this option has to be chosen with option dehumidification (opt. 41334135-4137)	The hot gas post-heating adjusts supply air temperature during dehumidification phases.
1463	Heating module management	This option it's for the management of the additional section of the unit in which a gas burner is placed. For the type of burner refer to option 1642 ÷ 1656	The natural gas-fired heating module is ideal for particularly cold climates. In the heat pump versions, the module can be used to integrate the heat
1466	Electric heater management	Option for Electric heater management, that are placed after direct expansion coil. For electric heater capacities, refer to 1312 ÷ 1318.	The electrical heating coil is a heating source which can be used as integration in heat pump working. Furthermore it can be used during defrosting cycles.

CODE	ACCESSORY NAME	DESCRIPTION	ADVANTAGES
1467	2 Rows Water (heating) coil	Water heating coil installed after the internal treatment coil	The coil can be used as a heating source or as integration in heat pump working. Antifreeze function trough opening of the three way valve.
1468	3 Rows Water (heating) coil	Water heating coil installed after the internal treatment coil	The coil can be used as a heating source or as integration in heat pump working. Antifreeze function trough opening of the three way valve.
1341	2 way valve V2V	Modulating mixing valve installed downstream the water heating coil, with modulating drive. This option can be choosen only with water heating coil (opt. 1467 or 1468)	
1342	3 way valve V3V	Modulating mixing valve installed close to the water heating coil, with modulating drive. This option can be choosen only with water heating coil (opt. 1467 or 1468)	
1345	Water coil control continuous signal	It's a continuous signal from controller to manage an external water valve actuator that controls hot water coil flow. This option can be choosen only with water heating coil (opt. 1467 or 1468)	
1312 ÷ 1318	Electrical heating coil	Electrical heater installed after the internal treatment coil. This option can be choosen only with electric heater management (opt.	
1466	The electrical heating coil is a heating source which can be used as integration in heat pump working. Furthermore it can be used during defrosting cycles.		
1642 ÷ 1647	Modulating gas fired heating module	The heat module features an additional section holding the condensing gas heating module, comprises a modulating premix gas burner and a stainless steel air/fumes exchanger. The heating module heats the air and inflows it into the room in such a way that it blows over the outer surface of the combustion chamber and the tubes of the exchanger. For the heat module option 1463 or 1464 (heating module management) it's mandatory.	The gas-fired condensation heat module offers: high heating power with a very compact heating module; elevated efficiency (up to 105%) due to the exploitation of the condensation heat; practically zero CO emissions and Nox levels < 35 ppm thanks to the use of a premix burner.
1648	Modulating heating module modulating control signal	Analogic output to manage an external gas bunnner. For this accessory, option 1463 or 1464 (heating module management) it's mandatory	
1651 ÷ 1656	Modulating gas fired heating module	Supplementary section, inside the unit, housing a module comprising a two-stage gas burner and a stainless steel air/flue gas heat exchanger. For the heat module option 1463 or 1464 (heating module management) it's mandatory.	The natural gas-fired heating module is ideal for particularly cold climates. In the heat pump versions, the module can be used to integrate the heat pump, while of course it replaces the heat pump in the cooling-only units. The two-steps gas heating module features the pre mixing gasair technology to increase the efficiency.
1657	Steps heating module control signal	Digital output to manage an external gas bunnner. For this accessory, option 1463 or 1464 (heating module management) it's mandatory	
4131	Ambient humidity probe	Probe to measure relative humidity percentage in the ambient, intalled on the return	
4132	Enthalpic Free cooling	Function manged by temperature and humidity probes, installed in a position allowing them to check and compare the energy status of both the ambient and the external air. The control manages the opening/closing of the dampers in order to exploit more favourable external conditions.	During Free cooling functioning, the resources are progressively disconnected, till complete switch off, keeping the required termo-hygrometric ambient condition, thanks to the external favourable conditions

CODE	ACCESSORY NAME	DESCRIPTION	ADVANTAGES
4133	Dehumidification	Thanks to a humidity probe, this function reduces during cooling mode the excess of humidity of the indoor air	Enthalpic control to maintain the ambient humidity to wellbeing values. It's recommended to use hot resource to post-heating supply air temperature during dehumidification phases.
4134	Signal for humidifier	The unit provides a signal for driving a humidifier, thanks to the reading of the humidity probe placed on return side. It's possible to have an humidifier installed inside the unit with different capacities (options 4303 ÷ 4308)	Adjustment of relative humidity in winter mode
4309A	Continuous signal for humidifier control	The unit provides an analogic signal for driving a humidifier, thanks to the reading of the humidity probe placed on return side.	
881	Cu/Cu condensing coils	Air-refrigerant heat exchanger with copper fins and tubes.	Recommended for applications in corrosive atmospheres
883	Condensing coils with epoxy-coated fins	Painted air-refrigerant heat exchanger.	Recommended for applications in medium level pollution atmospheres.
895	Condensing coils with Fin Guard Silver treatment	Air-refrigerant heat exchanger with epoxidic treatment on coils and fins.	Recommended for marine exposure conditions, with an high level of pollution or other aggressive atmospheres.
2032	Welded mesh protection coil	Welded mesh protection coil	These grills protect outside coil and part of the refrigerant circuit against the intrusion of solid bodies with medium large dimensions.
2033	Condenser coil protection painted metal sheet	Outside coils protection punched panel	These grills protect outside coil and part of the refrigerant circuit against the intrusion of solid bodies with medium large dimensions.
971	Cu/Cu internal coil	Internal air treatment coil with copper fins and tubes.	Recommended for applications in corrosive atmospheres
974	Internal coil with Fin Guard Silver treatment	Internal air treatment coil with epoxidic treatment on coils and fins.	Recommended for marine exposure conditions, with an high level of pollution or other aggressive atmospheres.
975	Internal coil with prepainted fins	Internal air treatment coil with prepainted fins	Recommended for applications in medium level pollution atmospheres.
381	Numbered wiring on electric board	During the execution of the electrical panel, in addition to identifying the individual inputs and outputs, electric cables are labeled for easier recognition.	Increase the usability of the electrical panel during maintenance.
382	PWR wirings according to Uk request	Power cables with coloring according to the U.K. standards.	
3591	Fans operating signal	Auxiliary contacts providing a voltagefree signal	Allows remote signalling of fans' activation or remote control of any auxiliary loads.
3601	Compressors' on/off signal	Auxiliary contacts providing a voltagefree signal	Allows remote signalling of compressor's activation or remote control of any auxiliary loads.
4121	Forced shut down	Digital inlet to switch off the unit from remote	
4161	Remote summer winter switch	Digital inlet to switch the unit operating mode from cooling to heating and viceversa	
4162	Automatic summer/winter switch	The unit changes its operating mode from cooling to heating according to outdoor and indoor air temperature	
6171	Input remote demand limit	Digital input (voltage free) to enable demand limit function	It permits to limit the unit's power absorption for safety reasons or in temporary situation.
4111	Remote forcing for air extraction	Digital input that manage the closing of the recirculation damper, the opening of the outlet and inlet dampers, the switching off of the compressors and the start of the supply and return fans	Digital input for extraction of the air in case of smoke. Fornisce un allarme in uscita
4172	Remote room washing	Digital input for the complete renewal of air in the empty room. Extraction and expulsion of the ambient air, introduction of renewal external air with switched off compressors	Renewal of ambient air when the room has not been used for a long time or whenever all the ambient air requires rapid changing
4173	Washing and running up	Function to be activated when the room is empty, first washing of the air in the room and then start-up in total air recirculation.	

CODE	ACCESSORY NAME	DESCRIPTION	ADVANTAGES
4381	Full fresh air	This digital input allows to work full fresh air	
4391	Total recirculation	This digital input allows to work in total recirculation	
4442	Double set point return temperature	It is possible to choose a second temperature set point value, different from that normally set and choose with whom to work via a digital input	
4444	Continuous set point return temperature	Return temperature set point variation is managed through analog input; the set point varies between a minimum and a maximum values previously fixed via unit display	
4271	Ambient air probe	Return air temperature probe supplied loose for ambient installation	
4272	Return air probe	Return air temperature probe supplied loose for return duct installation	
411	Electrical Panel with forced ventilation	Forced ventilation for electric switchboard	As standard, the electric panel is supplied with two air grills with filter and a duct that connects delivery side with the switchboard. When unit is installed in hot climate, it's suggested to add 411 option, that include two fans that extract hot air from the enclosure. Exhaust fans are controlled via a thermostat
2101	Rubber anti vibration device		
9966	Nylon packing	In addition to standard packing (opt. 9970), all the rooftop unit is wrapped with a nylon layer	
9970	Standard packing	The unit is supplied with plastic infills on the delivery and return of the treated air. Also lifting eye-plates are supplied as standard.	
9979	Container packing	In addition to nylon packing (opt. 9966), with container packing the unit is provided with handling devices to load it on a container (metal slides, front handling bar).	
9996	Container slides	In addition to standard packing (opt. 9970), the unit is provided with handling devices to load it on a container (metal slides, front handling bar).	

6. GENERAL TECHNICAL SPECIFICATIONS

WSM2 /AR - Standard unit										
GRANDEZZA			0264	0304	0354	0404	0444	0484	0524	0604
Cooling										
Cooling capacity	(1)	kW	81,1	88,7	104	122	133	144	159	182
Sensible capacity	(1)	kW	62,1	68,1	80,8	94,2	102	110	121	141
Total power consumption	(1)	kW	27,8	29,4	35,5	41,2	43,2	46,7	51,9	63,3
EER	(1)	-	2,92	3,02	2,93	2,96	3,08	3,08	3,06	2,88
Heating										
Heating capacity	(2)	kW	83,4	93,0	105	124	133	143	163	189
Total power consumption	(2)	kW	25,7	27,2	32,6	38,1	42,2	46,9	52,1	59,6
COP	(2)	-	3,25	3,42	3,22	3,25	3,15	3,05	3,13	3,17
Supply fans										
Type			Radial fan (plug fan)							
			EC motor with built-in controller							
Number		No.	1	2	2	2	2	2	2	2
Supply air flow-rate		m³/h	13.500	15.500	18.000	20.500	22.500	25.000	28.000	30.500
Available external static pressure	(3)	Pa	250	250	250	250	250	250	250	250
Outdoor fans										
Type			Axial φ 800mm							
Number		No.	2	2	2	2	3	4	4	4
External air flow-rate		m³/h	43060	41260	41260	39580	60880	77824	73260	73260
Nominal installed power		kW	3,7	3,7	3,7	3,7	5,55	7,4	7,4	7,4
Compressors										
No. compressors		No.	4	4	4	4	4	4	4	4
No. Circuits		No.	2	2	2	2	2	2	2	2
Number of capacity		No.	4	4	4	4	4	4	4	4
Refrigerant			R410A							
Sound power										
Global	(4)	dB(A)	83	84	86	87	85	86	87	87
Weights and dimensions										
Length		mm	3.665				4.465			
Width		mm	2.250							
Height		mm	2.410							
Operating weight standard unit	(5)	kg	1.666	1.802	1.800	1.908	2.205	2.275	2.445	2.471

Notes:

(1) Cooling: Outdoor 35°C 50% R.H. / Indoor 27°C 47% R.H. / Mix 0%.

(2) Heating: Outdoor 7°C 87% R.H. / Indoor 20°C 50% R.H. / Mix 0%.

(3) ESP for standard configuration (optional accessories not included/calculated).

(4) Sound power on the basis of measurements made in compliance with ISO 3744. For complete sound data consult Elca Sudio.

(5) Unit in standard configuration/execution, without optional accessories.

GENERAL TECHNICAL SPECIFICATIONS

WSM2 /MF										
SIZE			0264	0304	0354	0404	0444	0484	0524	0604
Cooling										
Cooling capacity	(1)	kW	86,8	94,8	111	130	142	153	170	194
Sensible capacity	(1)	kW	62,7	68,7	81,5	94,9	103	110	122	142
Total power consumption	(1)	kW	28,3	29,9	36,0	41,8	43,8	47,3	52,6	64,4
EER	(1)	-	3,07	3,17	3,08	3,11	3,24	3,23	3,23	3,01
Heating										
Heating capacity	(2)	kW	84,3	94,0	107	125	135	145	166	191
Total power consumption	(2)	kW	23,9	25,4	30,6	35,5	39,5	44,0	49,1	56,5
COP	(2)	-	3,53	3,70	3,50	3,52	3,42	3,30	3,38	3,38
Supply fans										
Type			Radial fan (plug fan)							
			EC motor with built-in controller							
Number		No.	1	2	2	2	2	2	2	2
Supply air flow-rate		m ³ /h	13.500	15.500	18.000	20.500	22.500	25.000	28.000	30.500
Available external static pressure	(3)	Pa	250	250	250	250	250	250	250	250
Outdoor fans										
Type			Axial φ 800mm							
Number		No.	2	2	2	2	3	4	4	4
External air flow-rate		m ³ /h	43060	41260	41260	39580	60880	77824	73260	73260
Nominal installed power		kW	3,7	3,7	3,7	3,7	5,55	7,4	7,4	7,4
Compressors										
No. compressors		No.	4	4	4	4	4	4	4	4
No. Circuits		No.	2	2	2	2	2	2	2	2
Number of capacity		No.	4	4	4	4	4	4	4	4
Refrigerant			R410A							
Sound power										
Global	(4)	dB(A)	83	84	86	87	85	86	87	87
Weights and dimensions										
Length		mm	4.800				5.600			
Width		mm	2.250							
Height		mm	2.410							
Operating weight standard unit	(5)	kg	2.114	2.250	2.248	2.356	2.653	2.723	2.893	2.919

Notes:

(1) Cooling: Outdoor 35°C 50% R.H. / Indoor 27°C 47% R.H. / Mix 30%.

(2) Heating: Outdoor 7°C 87% R.H. / Indoor 20°C 50% R.H. / Mix 30%.

(3) ESP for standard configuration (optional accessories not included/calculated).

(4) Sound power on the basis of measurements made in compliance with ISO 3744. For complete sound data consult Elca Sudio.

(5) Unit in standard configuration/execution, without optional accessories.

GENERAL TECHNICAL SPECIFICATIONS

WSM2 /AX										
SIZE			0264	0304	0354	0404	0444	0484	0524	0604
Cooling										
Cooling capacity	(1)	kW	86,8	94,8	111	130	142	153	170	194
Sensible capacity	(1)	kW	62,7	68,7	81,5	94,9	103	110	122	142
Total power consumption	(1)	kW	30,9	32,5	38,6	44,4	49,0	52,5	57,8	69,6
EER	(1)	-	2,81	2,92	2,88	2,93	2,90	2,91	2,94	2,79
Heating										
Heating capacity	(2)	kW	84,3	94,0	107	125	135	145	166	191
Total power consumption	(2)	kW	26,5	28,0	33,2	38,1	44,7	49,2	54,3	61,7
COP	(2)	-	3,18	3,36	3,22	3,28	3,02	2,95	3,06	3,10
Supply fans										
Type			Radial fan (plug fan)							
			EC motor with built-in controller							
Number		No.	1	2	2	2	2	2	2	2
Supply air flow-rate		m³/h	13.500	15.500	18.000	20.500	22.500	25.000	28.000	30.500
Available external static pressure	(3)	Pa	250	250	250	250	250	250	250	250
Outdoor fans										
Type			Axial φ 800mm							
Number		No.	2	2	2	2	3	4	4	4
External air flow-rate		m³/h	43060	41260	41260	39580	60880	77824	73260	73260
Nominal installed power		kW	3,7	3,7	3,7	3,7	5,55	7,4	7,4	7,4
Compressors										
No. compressors		No.	4	4	4	4	4	4	4	4
No. Circuits		No.	2	2	2	2	2	2	2	2
Number of capacity		No.	4	4	4	4	4	4	4	4
Refrigerant			R410A							
Expulsion fans										
Type			Axial φ 710 mm							
Number		No.	1	1	1	1	2	2	2	2
Expulsion air flow rate			4050	4650	5400	6150	6750	7500	8400	9150
Available external static pressure	(3)	Pa	150	150	150	150	150	150	150	150
Sound power										
Global	(4)	dB(A)	83	84	86	87	85	86	87	87
Weights and dimensions										
Length	(6)	mm	4.800				5.600			
Width		mm	2.250							
Height		mm	2.410							
Operating weight standard unit	(5)	kg	2.167	2.303	2.301	2.409	2.739	2.809	2.979	3.005

Notes:

- (1) Cooling: Outdoor 35°C 50% R.H. / Indoor 27°C 47% R.H. / Mix 30%.
(2) Heating: Outdoor 7°C 87% R.H. / Indoor 20°C 50% R.H. / Mix 30%.
(3) ESP for standard configuration (optional accessories not included/calculated).
(4) Sound power on the basis of measurements made in compliance with ISO 3744. For complete sound data consult Elca Sudio.
(5) Unit in standard configuration/execution, without optional accessories.
(6) The dimension does not include hood and expulsion fans

GENERAL TECHNICAL SPECIFICATIONS

WSM2 /CE										
SIZE			0264	0304	0354	0404	0444	0484	0524	0604
Cooling										
Cooling capacity	(1)	kW	86,8	94,8	111	130	142	153	170	194
Sensible capacity	(1)	kW	62,7	68,7	81,5	94,9	103	110	122	142
Total power consumption	(1)	kW	30,2	32,4	38,2	44,4	43,8	47,3	52,6	64,4
EER	(1)	-	2,87	2,93	2,91	2,93	3,24	3,23	3,23	3,01
Heating										
Heating capacity	(2)	kW	84,3	94,0	107	125	135	145	166	191
Total power consumption	(2)	kW	25,8	27,9	32,7	38,0	39,5	44,0	49,1	56,5
COP	(2)	-	3,27	3,37	3,27	3,29	3,42	3,30	3,38	3,38
Supply fans										
Type			Radial fan (plug fan)							
			EC motor with built-in controller							
Number		No.	1	2	2	2	2	2	2	2
Supply air flow-rate		m³/h	13.500	15.500	18.000	20.500	22.500	25.000	28.000	30.500
Available external static pressure	(3)	Pa	250	250	250	250	250	250	250	250
Outdoor fans										
Type			Axial φ 800mm							
Number		No.	2	2	2	2	3	4	4	4
External air flow-rate		m³/h	43060	41260	41260	39580	60880	77824	73260	73260
Nominal installed power		kW	3,7	3,7	3,7	3,7	5,55	7,4	7,4	7,4
Compressors										
No. compressors		No.	4	4	4	4	4	4	4	4
No. Circuits		No.	2	2	2	2	2	2	2	2
Number of capacity		No.	4	4	4	4	4	4	4	4
Refrigerant			R410A							
Return fans										
Type			Radial fan (plug fan)							
			EC motor with built-in controller							
Number		No.	1	1	2	2	2	2	2	2
Return air flow rate			13.500	15.500	18.000	20.500	22.500	25.000	28.000	30.500
Available external static pressure	(3)	Pa	250	250	250	250	250	250	250	250
Sound power										
Global	(4)	dB(A)	83	84	86	87	85	86	87	87
Weights and dimensions										
Length		mm	6.100				6.900			
Width	(7)	mm	2.250							
Height		mm	2.410							
Operating weight standard unit	(5)	kg	2.805	2.941	2.909	3.017	3.324	3.394	3.580	3.606

Notes:

- (1) Cooling: Outdoor 35°C 50% R.H. / Indoor 27°C 47% R.H. / Mix 30%.
(2) Heating: Outdoor 7°C 87% R.H. / Indoor 20°C 50% R.H. / Mix 30%.
(3) ESP for standard configuration (optional accessories not included/calculated).
(4) Sound power on the basis of measurements made in compliance with ISO 3744. For complete sound data consult Elca Sudio.
(5) Unit in standard configuration/execution, without optional accessories.
(7) The dimension does not include hoods and the thickness of the pre-filter for fresh air if present.

GENERAL TECHNICAL SPECIFICATIONS

WSM2 /HR-B										
SIZE			0264	0304	0354	0404	0444	0484	0524	0604
Cooling										
Cooling capacity	(1)	kW	94,3	103	120	141	154	167	184	211
Sensible capacity	(1)	kW	65,8	72,0	85,5	99,6	108	116	127	149
Total power consumption	(1)	kW	30,3	32,4	38,3	44,5	43,8	47,3	52,6	64,4
EER	(1)	-	3,11	3,18	3,13	3,17	3,52	3,53	3,50	3,28
Heating										
Heating capacity	(2)	kW	90,9	101	115	135	146	156	179	206
Total power consumption	(2)	kW	26,5	28,7	33,6	39,1	40,5	45,1	50,3	57,9
COP	(2)	-	3,42	3,54	3,41	3,45	3,60	3,46	3,55	3,56
Supply fans										
Type			Radial fan (plug fan)							
			EC motor with built-in controller							
Number		No.	1	2	2	2	2	2	2	2
Supply air flow-rate		m³/h	13.500	15.500	18.000	20.500	22.500	25.000	28.000	30.500
Available external static pressure	(3)	Pa	250	250	250	250	250	250	250	250
Outdoor fans										
Type			Axial φ 800mm							
Number		No.	2	2	2	2	3	4	4	4
External air flow-rate		m³/h	43060	41260	41260	39580	60880	77824	73260	73260
Nominal installed power		kW	3,7	3,7	3,7	3,7	5,55	7,4	7,4	7,4
Compressors										
No. compressors		No.	4	4	4	4	4	4	4	4
No. Circuits		No.	2	2	2	2	2	2	2	2
Number of capacity		No.	4	4	4	4	4	4	4	4
Refrigerant			R410A							
Return fans										
Type			Radial fan (plug fan)							
			EC motor with built-in controller							
Number		No.	1	1	2	2	2	2	2	2
Return air flow rate			13.500	15.500	18.000	20.500	22.500	25.000	28.000	30.500
Available external static pressure	(3)	Pa	250	250	250	250	250	250	250	250
Sound power										
Global	(4)	dB(A)	83	84	86	87	85	86	87	87
Weights and dimensions										
Length		mm	6.100				6.900			
Width	(7)	mm	2.250							
Height		mm	2.410							
Operating weight standard unit	(5)	kg	2.858	2.994	2.962	3.070	3.393	3.465	3.651	3.677

Notes:

- (1) Cooling: Outdoor 35°C 50% R.H. / Indoor 27°C 47% R.H. / Mix 30%.
(2) Heating: Outdoor 7°C 87% R.H. / Indoor 20°C 50% R.H. / Mix 30%.
(3) ESP for standard configuration (optional accessories not included/calculated).
(4) Sound power on the basis of measurements made in compliance with ISO 3744. For complete sound data consult Elca Sudio.
(5) Unit in standard configuration/execution, without optional accessories.
(7) The dimension does not include hoods and the thickness of the pre-filter for fresh air if present.

GENERAL TECHNICAL SPECIFICATIONS

WSM2 /HR-P LOW FLOW										
SIZE			0264	0304	0354	0404	0444	0484	0524	0604
Cooling										
Cooling capacity	(1)	kW	91,8	100	117	137	149	162	179	204
Sensible capacity	(1)	kW	64,7	71,0	84,0	97,7	106	114	126	146
Total power consumption	(1)	kW	30,4	32,7	39,0	45,2	44,3	47,8	53,3	65,2
EER	(1)	-	3,02	3,06	3,00	3,03	3,36	3,39	3,36	3,13
Heating										
Heating capacity	(2)	kW	93,4	104	118	138	147	160	183	210
Total power consumption	(2)	kW	27,0	29,3	34,6	40,2	41,2	46,0	51,4	59,0
COP	(2)	-	3,45	3,57	3,42	3,43	3,57	3,48	3,56	3,55
Supply fans										
Type			Radial fan (plug fan)							
			EC motor with built-in controller							
Number		No.	1	2	2	2	2	2	2	2
Supply air flow-rate		m³/h	13.500	15.500	18.000	20.500	22.500	25.000	28.000	30.500
Available external static pressure	(3)	Pa	250	250	250	250	250	250	250	250
Outdoor fans										
Type			Axial φ 800mm							
Number		No.	2	2	2	2	3	4	4	4
External air flow-rate		m³/h	43060	41260	41260	39580	60880	77824	73260	73260
Nominal installed power		kW	3,7	3,7	3,7	3,7	5,55	7,4	7,4	7,4
Compressors										
No. compressors		No.	4	4	4	4	4	4	4	4
No. Circuits		No.	2	2	2	2	2	2	2	2
Number of capacity		No.	4	4	4	4	4	4	4	4
Refrigerant			R410A							
Return fans										
Type			Radial fan (plug fan)							
			EC motor with built-in controller							
Number		No.	1	1	2	2	2	2	2	2
Return air flow rate			13.500	15.500	18.000	20.500	22.500	25.000	28.000	30.500
Available external static pressure	(3)	Pa	250	250	250	250	250	250	250	250
Sound power										
Global	(4)	dB(A)	83	84	86	87	85	86	87	87
Weights and dimensions										
Length		mm	6.100				6.900			
Width	(7)	mm	2.250							
Height		mm	2.410							
Operating weight standard unit	(5)	kg	2.865	3.001	2.969	3.077	3.384	3.454	3.640	3.666

Notes:

- (1) Cooling: Outdoor 35°C 50% R.H. / Indoor 27°C 47% R.H. / Mix 30%.
(2) Heating: Outdoor 7°C 87% R.H. / Indoor 20°C 50% R.H. / Mix 30%.
(3) ESP for standard configuration (optional accessories not included/calculated).
(4) Sound power on the basis of measurements made in compliance with ISO 3744. For complete sound data consult Elca Sudio.
(5) Unit in standard configuration/execution, without optional accessories.
(7) The dimension does not include hoods and the thickness of the pre-filter for fresh air if present.

GENERAL TECHNICAL SPECIFICATIONS

WSM2 /HR-P HIGH FLOW										
SIZE			0264	0304	0354	0404	0444	0484	0524	0604
Cooling										
Cooling capacity	(1)	kW	92,2	101	118	138	150	163	180	205
Sensible capacity	(1)	kW	64,8	71,2	84,2	97,9	106	114	126	146
Total power consumption	(1)	kW	30,2	32,4	38,4	44,5	43,9	47,4	52,7	64,5
EER	(1)	-	3,05	3,12	3,07	3,10	3,42	3,44	3,42	3,18
Heating										
Heating capacity	(2)	kW	94,1	105	119	139	151	162	184	211
Total power consumption	(2)	kW	26,9	29,0	34,2	39,7	41,1	45,7	50,9	58,4
COP	(2)	-	3,49	3,62	3,49	3,51	3,66	3,54	3,62	3,62
Supply fans										
Type			Radial fan (plug fan)							
			EC motor with built-in controller							
Number		No.	1	2	2	2	2	2	2	2
Supply air flow-rate		m³/h	13.500	15.500	18.000	20.500	22.500	25.000	28.000	30.500
Available external static pressure	(3)	Pa	250	250	250	250	250	250	250	250
Outdoor fans										
Type			Axial φ 800mm							
Number		No.	2	2	2	2	3	4	4	4
External air flow-rate		m³/h	43060	41260	41260	39580	60880	77824	73260	73260
Nominal installed power		kW	3,7	3,7	3,7	3,7	5,55	7,4	7,4	7,4
Compressors										
No. compressors		No.	4	4	4	4	4	4	4	4
No. Circuits		No.	2	2	2	2	2	2	2	2
Number of capacity		No.	4	4	4	4	4	4	4	4
Refrigerant			R410A							
Return fans										
Type			Radial fan (plug fan)							
			EC motor with built-in controller							
Number		No.	1	1	2	2	2	2	2	2
Return air flow rate			13.500	15.500	18.000	20.500	22.500	25.000	28.000	30.500
Available external static pressure	(3)	Pa	250	250	250	250	250	250	250	250
Sound power										
Global	(4)	dB(A)	83	84	86	87	85	86	87	87
Weights and dimensions										
Length		mm	6.100				6.900			
Width	(7)	mm	2.250							
Height		mm	2.410							
Operating weight standard unit	(5)	kg	2.940	3.076	3.044	3.152	3.459	3.529	3.715	3.741

Notes:

- (1) Cooling: Outdoor 35°C 50% R.H. / Indoor 27°C 47% R.H. / Mix 30%.
(2) Heating: Outdoor 7°C 87% R.H. / Indoor 20°C 50% R.H. / Mix 30%.
(3) ESP for standard configuration (optional accessories not included/calculated).
(4) Sound power on the basis of measurements made in compliance with ISO 3744. For complete sound data consult Elca Sudio.
(5) Unit in standard configuration/execution, without optional accessories.
(7) The dimension does not include hoods and the thickness of the pre-filter for fresh air if present.

GENERAL TECHNICAL SPECIFICATIONS

WSM2 /HR-E										
SIZE			0264	0304	0354	0404	0444	0484	0524	0604
Cooling										
Cooling capacity	(1)	kW	110	122	141	164	179	195	215	242
Sensible capacity	(1)	kW	70,9	77,9	91,9	107,0	116	125	137	158
Total power consumption	(1)	kW	30,1	32,4	38,5	44,6	43,7	47,2	52,5	64,1
EER	(1)	-	3,65	3,77	3,66	3,68	4,10	4,13	4,10	3,78
Heating										
Heating capacity	(2)	kW	102	114	129	150	163	175	199	227
Total power consumption	(2)	kW	27,4	29,6	34,9	40,5	41,7	46,4	51,6	59,0
COP	(2)	-	3,72	3,85	3,70	3,70	3,91	3,78	3,86	3,84
Supply fans										
Type			Radial fan (plug fan)							
			EC motor with built-in controller							
Number		No.	1	2	2	2	2	2	2	2
Supply air flow-rate		m³/h	13.500	15.500	18.000	20.500	22.500	25.000	28.000	30.500
Available external static pressure	(3)	Pa	250	250	250	250	250	250	250	250
Outdoor fans										
Type			Axial φ 800mm							
Number		No.	2	2	2	2	3	4	4	4
External air flow-rate		m³/h	43060	41260	41260	39580	60880	77824	73260	73260
Nominal installed power		kW	3,7	3,7	3,7	3,7	5,55	7,4	7,4	7,4
Compressors										
No. compressors		No.	4	4	4	4	4	4	4	4
No. Circuits		No.	2	2	2	2	2	2	2	2
Number of capacity		No.	4	4	4	4	4	4	4	4
Refrigerant			R410A							
Return fans										
Type			Radial fan (plug fan)							
			EC motor with built-in controller							
Number		No.	1	1	2	2	2	2	2	2
Return air flow rate			13.500	15.500	18.000	20.500	22.500	25.000	28.000	30.500
Available external static pressure	(3)	Pa	250	250	250	250	250	250	250	250
Sound power										
Global	(4)	dB(A)	83	84	86	87	85	86	87	87
Weights and dimensions										
Length		mm	6.100				6.900			
Width	(7)	mm	2.250							
Height		mm	2.410							
Operating weight standard unit	(5)	kg	2.976	3.112	3.080	3.188	3.546	3.616	3.802	3.828

Notes:

- (1) Cooling: Outdoor 35°C 50% R.H. / Indoor 27°C 47% R.H. / Mix 30%.
(2) Heating: Outdoor 7°C 87% R.H. / Indoor 20°C 50% R.H. / Mix 30%.
(3) ESP for standard configuration (optional accessories not included/calculated).
(4) Sound power on the basis of measurements made in compliance with ISO 3744. For complete sound data consult Elca Sudio.
(5) Unit in standard configuration/execution, without optional accessories.
(7) The dimension does not include hoods and the thickness of the pre-filter for fresh air if present.

TECHNICAL DATA SEASONAL EFFICIENCY IN HEATING (EN14825:2016 VALUE)

SIZE			0264	0304	0354	0404	0444	0484	0524	0604
WEATHER CONDITIONS - AVERAGE (1)										
Definition	Symbol									
Air flow		m ³ /h	13.500	15.500	18.000	20.500	22.500	25.000	28.000	30.500
Design heating load	P _{design,h}	kW	65,2	73,1	82,8	96,8	104,3	111,9	128,1	147,3
Reference design temperature	T _{design,h}	°C	-10,0	-10,0	-10,0	-10,0	-10,0	-10,0	-10,0	-10,0
Bivalent temperature	T _{biv}	°C	-6,0	-6,0	-6,0	-6,0	-6,0	-6,0	-6,0	-6,0
Seasonal coefficient of performance	SCOP		3,2	3,25	3,25	3,27	3,31	3,21	3,21	3,21
Seasonal space heating energy efficiency	η _{s,h}	%	125,14	126,98	126,83	127,72	129,34	125,54	125,4	125,24

(1) : Indoor conditions: 20°C d.b. - 15°C w.b.
Type of calculation with fixed flow

TECHNICAL DATA SEASONAL EFFICIENCY IN COOLING (EN14825:2016 VALUE)

SIZE			0264	0304	0354	0404	0444	0484	0524	0604
WEATHER CONDITIONS - AVERAGE (2)										
Definition	Symbol									
Air flow		m ³ /h	13.500	15.500	18.000	20.500	22.500	25.000	28.000	30.500
Design cooling load	P _{design,c}	kW	81,8	89,7	105,1	123,4	134,2	145,5	161,1	184,5
Reference design temperature	T _{design,c}	°C	35,0	35,0	35,0	35,0	35,0	35,0	35,0	35,0
Seasonal coefficient of performance	SEER		3,7	3,95	3,98	4,02	3,88	3,74	3,62	3,61
Seasonal space cooling energy efficiency	η _{s,c}	%	144,9	154,81	156,09	157,83	152,35	146,46	141,86	141,31

(2) : Indoor conditions: 27°C d.b. - 19°C w.b.
Type of calculation with fixed flow

MATCHING TABLE FOR FUNCTIONS, ACCESSORIES AND AIR FLOW DIRECTIONS

CONFIGURATION				DIREZIONE MANDATA ARIA (1)				DIREZIONE RIPRESA ARIA (1)				
Option code →				2072	2075	2076	2077	2061	2062	2063	2065	2067
Function	Accessory			DOWN-STRE-AM	TOP SIDE	RIGHT SIDE	LEFT SIDE	REAR	RIGHT SIDE	DOWN-STRE-AM	LEFT SIDE	TOP SIDE
	Option code	Description	What is it possible?									
AR	1467	2 ROWS WATER COIL H2R	ONLY ONE OF THEM	YES	YES	YES	YES	YES	NO	NO	NO	NO
	1468	3 ROWS WATER COIL H3R										
	1466	ELECTRIC HEATER MANAGEMENT										
	1461	HOT GAS COIL										
	1463	HEATING MODULE MANAGEMENT										
	1464	HEATING MOD. MAN.+HOT GAS COIL										
MF	1467	2 ROWS WATER COIL H2R	ONLY ONE OF THEM	YES	YES	YES	YES	YES	YES	YES	YES	YES
	1468	3 ROWS WATER COIL H3R										
	1466	ELECTRIC HEATER MANAGEMENT										
	1461	HOT GAS COIL										
	1463	HEATING MODULE MANAGEMENT										
	1464	HEATING MOD. MAN.+HOT GAS COIL										
AX	1467	2 ROWS WATER COIL H2R	ONLY ONE OF THEM	YES	YES	YES	YES	NO (2)	YES	NO	YES	NO
	1468	3 ROWS WATER COIL H3R										
	1466	ELECTRIC HEATER MANAGEMENT										
	1461	HOT GAS COIL										
	1463	HEATING MODULE MANAGEMENT										
	1464	HEATING MOD. MAN.+HOT GAS COIL										
CE, HR-B, HR-E	1467	2 ROWS WATER COIL H2R	ONLY ONE OF THEM	YES	YES	YES	YES	YES	YES	YES	YES	YES
	1468	3 ROWS WATER COIL H3R										
	1466	ELECTRIC HEATER MANAGEMENT										
	1461	HOT GAS COIL										
	1463	HEATING MODULE MANAGEMENT										
	1464	HEATING MOD. MAN.+HOT GAS COIL										
HR-P L.F. & H.F.	1467	2 ROWS WATER COIL H2R	ONLY ONE OF THEM	YES	YES	YES	YES	YES	NO	NO	YES	NO
	1468	3 ROWS WATER COIL H3R										
	1466	ELECTRIC HEATER MANAGEMENT										
	1461	HOT GAS COIL										
	1463	HEATING MODULE MANAGEMENT										
	1464	HEATING MOD. MAN.+HOT GAS COIL										

Remarks:

(1) = Point of view: in front of electric panel.

(2) = Available as SPECIAL option. Contact the Headquarter.

YES: Available (as an option)

NO: Not available. For special request, contact the Headquarter.

SUPPLY FANS (For all functions)

Size		0264	0304	0354	0404	0444	0484	0524	0604
Minimum air flow	[m³/h]	9.500	10.800	12.600	14.000	15.500	17.500	19.500	21.300
Nominal air flow	[m³/h]	13.500	15.500	18.000	20.500	22.500	25.000	28.000	30.500
Maximum air flow	[m³/h]	15.000	18.000	22.000	23.000	28.500	28.500	33.000	33.000

Option code	Type	Size	0264	0304	0354	0404	0444	0484	0524	0604
4250	EC PLUG FAN, standard	F.L.I.	2,8	5,6	5,6	5,6	5,6	10,0	10,0	10,0
		F.L.A.	4,4	8,8	8,8	8,8	8,8	16,0	16,0	16,0
	Number	No.	1	2	2	2	2	2	2	2
4251	EC PLUG FAN, higher rating (MM1)	F.L.I.	5,0	10,0	10,0	10,0	15,0	15,0	20,0	20,0
		F.L.A.	8,0	16,0	16,0	16,0	24,0	24,0	32,0	32,0
	Number	No.	1	2	2	2	3	3	4	4

The electrical data shown are total values.

FLI Power consumption in max. admissible conditions. [kW]

FLA Current draw in max. admissible conditions. [A]

Unit in the standard configuration, without accessories

Limit flow-rate to ensure a maximum coil flow-through speed of 2.7 m/s

For detailed specifications contact Elca

EXHAUST AIR FANS (For AX function)

Size		0264	0304	0354	0404	0444	0484	0524	0604
Axial-flow fan	F.L.I.	2,6	2,6	2,6	2,6	5,2	5,2	5,2	5,2
	F.L.A.	4,8	4,8	4,8	4,8	9,6	9,6	9,6	9,6
Nominal fan diameter	mm	710	710	710	710	710	710	710	710
Number	No.	1	1	1	1	2	2	2	2

The electrical data shown are total values.

FLI Power consumption in max. admissible conditions. [kW]

FLA Current draw in max. admissible conditions. [A]

Unit in the standard configuration, without accessories

For detailed specifications contact Elca

RETURN AIR FANS (For CE, HR-B, HR-P, HR-E functions)

Size		0264	0304	0354	0404	0444	0484	0524	0604
Minimum air flow	m³/h	9.500	10.800	12.600	14.000	15.500	17.500	19.500	21.300
Nominal air flow	m³/h	13.500	15.500	18.000	20.500	22.500	25.000	28.000	30.500
Maximum air flow	m³/h	15.000	18.000	22.000	23.000	28.500	28.500	33.000	33.000

Option code	Type	Size	0264	0304	0354	0404	0444	0484	0524	0604
4240	EC PLUG FAN, standard	F.L.I.	2,8	2,8	5,6	5,6	5,6	5,6	5,6	5,6
		F.L.A.	4,4	4,4	8,8	8,8	8,8	8,8	8,8	8,8
	Number	No.	1	1	2	2	2	2	2	2
4241	EC PLUG FAN, higher rating (MM1)	F.L.I.	6,8	6,8	6,8	6,8	10,0	10,0	12,0	12,0
		F.L.A.	10,8	10,8	10,8	10,8	16,0	16,0	18,8	18,8
	Number	No.	2	2	2	2	2	2	2	2

The electrical data shown are total values.

FLI Power consumption in max. admissible conditions. [kW]

FLA Current draw in max. admissible conditions. [A]

Unit in the standard configuration, without accessories

For detailed specifications contact Elca

ELECTRICAL DATA

AR and MF functions														
Size	Compressors			Supply fans			Return fans			Auxiliary		Total		
	No.	F.L.I.	F.L.A.	No.	F.L.I.	F.L.A.	No.	F.L.I.	F.L.A.	F.L.I.	F.L.A.	F.L.I.	F.L.A.	S.A.
		[kW]	[A]		[kW]	[A]		[kW]	[A]					
0264	4	33	57	1	2,80	4,40	2	3,70	7,60	0,50	0,72	40	70	157
0304	4	36	58	2	5,60	8,80	2	3,70	7,60	0,50	0,72	46	75	155
0354	4	40	69	2	5,60	8,80	2	3,70	7,60	0,50	0,72	49	86	197
0404	4	47	78	2	5,60	8,80	2	3,70	7,60	0,50	0,72	57	95	193
0444	4	49	82	2	5,60	8,80	3	5,55	11,40	0,50	0,72	61	103	199
0484	4	52	86	2	10,00	16,00	4	7,40	15,20	0,50	0,72	70	118	214
0524	4	59	108	2	10,00	16,00	4	7,40	15,20	0,50	0,72	77	140	253
0604	4	68	120	2	10,00	16,00	4	7,40	15,20	0,50	0,72	86	152	296

AX function																	
Size	Compressors			Supply fans			Return fans			Axial fans			Auxiliary		Total		
	No.	F.L.I.	F.L.A.	No.	F.L.I.	F.L.A.	No.	F.L.I.	F.L.A.	No.	F.L.I.	F.L.A.	F.L.I.	F.L.A.	F.L.I.	F.L.A.	S.A.
		[kW]	[A]		[kW]	[A]		[kW]	[A]		[kW]	[A]					
0264	4	33	57	1	2,80	4,40	1	2,60	4,80	2	3,70	7,60	0,50	0,72	43	75	161
0304	4	36	58	2	5,60	8,80	1	2,60	4,80	2	3,70	7,60	0,50	0,72	48	80	160
0354	4	40	69	2	5,60	8,80	1	2,60	4,80	2	3,70	7,60	0,50	0,72	52	90	201
0404	4	47	78	2	5,60	8,80	1	2,60	4,80	2	3,70	7,60	0,50	0,72	59	100	198
0444	4	49	82	2	5,60	8,80	2	5,20	9,60	3	5,55	11,40	0,50	0,72	66	112	209
0484	4	52	86	2	10,00	16,00	2	5,20	9,60	4	7,40	15,20	0,50	0,72	75	127	224
0524	4	59	108	2	10,00	16,00	2	5,20	9,60	4	7,40	15,20	0,50	0,72	82	150	263
0604	4	68	120	2	10,00	16,00	2	5,20	9,60	4	7,40	15,20	0,50	0,72	91	162	306

CE, HR-B, HR-P, HR-E functions																	
Size	Compressors			Supply fans			Return fans			Axial fans			Auxiliary		Total		
	No.	F.L.I.	F.L.A.	No.	F.L.I.	F.L.A.	No.	F.L.I.	F.L.A.	No.	F.L.I.	F.L.A.	F.L.I.	F.L.A.	F.L.I.	F.L.A.	S.A.
		[kW]	[A]		[kW]	[A]		[kW]	[A]		[kW]	[A]					
0264	4	33	57	1	2,80	4,40	1	2,80	4,40	2	3,70	7,60	0,50	0,72	43	74	161
0304	4	36	58	2	5,60	8,80	1	2,80	4,40	2	3,70	7,60	0,50	0,72	48	79	160
0354	4	40	69	2	5,60	8,80	2	5,60	8,80	2	3,70	7,60	0,50	0,72	55	94	205
0404	4	47	78	2	5,60	8,80	2	5,60	8,80	2	3,70	7,60	0,50	0,72	62	104	202
0444	4	49	82	2	5,60	8,80	2	5,60	8,80	3	5,55	11,40	0,50	0,72	67	111	208
0484	4	52	86	2	10,00	16,00	2	5,60	8,80	4	7,40	15,20	0,50	0,72	76	126	223
0524	4	59	108	2	10,00	16,00	2	5,60	8,80	4	7,40	15,20	0,50	0,72	82	149	262
0604	4	68	120	2	10,00	16,00	2	5,60	8,80	4	7,40	15,20	0,50	0,72	91	161	305

NOTE: Data refer to standard unit

F.L.I. Absorbed power at max. permissible conditions
 F.L.A. Absorbed current at max. permissible conditions
 L.R.A. Compressor lock rotor current
 S.A. Peak current of unit with standard motors

Electrical power input:

- 400/3/50 WITHOUT NEUTRAL
- Permissible voltage variation 10%
- Maximum unbalance between phase voltages 3%

STANDARD COMPRESSORS

Size	Type	CIRCUIT 1					CIRCUIT 2				
		No.	Connection	F.L.I.	F.L.A.	L.R.A.	No.	Connection	F.L.I.	F.L.A.	L.R.A.
				[kW]	[A]	[A]			[kW]	[A]	[A]
0264	scroll	2	tandem	8,3	14,3	101	2	tandem	8,3	14,3	101
0304	scroll	2	tandem	9,0	14,4	95	2	tandem	9,0	14,4	95
0354	scroll	2	tandem	9,9	17,1	128	2	tandem	9,9	17,1	128
0404	scroll	2	tandem	11,7	19,4	118	2	tandem	11,7	19,4	118
0444	scroll	2	tandem	11,7	19,4	118	2	tandem	13,0	21,4	118,0
0484	scroll	2	tandem	13,0	21,4	118	2	tandem	13,0	21,4	118,0
0524	scroll	2	tandem	14,7	27,0	140	2	tandem	14,7	27,0	140,0
0604	scroll	2	tandem	16,9	30,0	174	2	tandem	16,9	30,0	174,0

Electrical data refer to the individual component.
 FLI Power consumption in max. admissible conditions.
 FLA Current draw in max. admissible conditions.
 LRA Locked rotor current

HEATING WATER COIL (Accessory)

	Size	0264	0304	0354	0404	0444	0484	0524	0604	
2-ROWS COIL	Airflow	[m ³ /h]	13.500	15.500	18.000	20.500	22.500	25.000	28.000	30.500
	Thermal power	kW	107	116	128	146	155	165	188	198
	Flowrate	l/s	1,30	1,42	1,56	1,79	1,89	2,01	2,30	2,41
	Pressure drops water side	kPa	26,1	30,3	35,4	34,4	37,9	42,2	36,5	39,8
	Pressure drop air side	Pa	16	20	26	25	29	39,4	32	36
	Type of water connections		Male threaded connections							
	DN - Nominal diameter IN	mm	DN 25						DN 32	
	DN - Nominal diameter OUT	mm	DN 25						DN 32	
3-ROWS COIL	Thermal power	kW	142	156	172	199	211	226	258	272
	Flowrate	l/s	1,73	1,9	2,1	2,42	2,58	2,76	3,14	3,32
	Pressure drops water side	kPa	21,1	24,7	29,2	51,9	57,6	64,7	61,1	67,1
	Pressure drop air side	Pa	24	30	39	37	43	46,6	48	55
	Type of water connections		Male threaded connections							
	DN - Nominal diameter IN	mm	DN 32							
	DN - Nominal diameter OUT	mm	DN 32							

Nominal heating capacity, entering air temperature 20°C, to the capacity indicated and IN/OUT water temperature 80/60°C

THREE-WAY WATER VALVES (accessory)

	Size	0264	0304	0354	0404	0444	0484	0524	0604	
2-ROWS COIL	kvs valve	[m ³ /h]	10	10	10	10	10	10	16	16
	DN - Nominal diameter	mm	25	25	25	25	25	25	32	32
3-ROWS COIL	kvs valve	[m ³ /h]	16	16	16	16	16	16	16	16
	DN - Nominal diameter	mm	32	32	32	32	32	32	32	32
	Type of actuator		0-10 V proportional control (managed by AIR 3000 TE controller)							
	Type of valve connection		Threaded connections							

ELECTRICAL HEATING COIL (Accessory)

Combinations units / electrical heating coil

Electrical heating coil				Unit size							
Option code	Size	Thermal power [kW]	Absorbed current [A]	0264	0304	0354	0404	0444	0484	0524	0604
1313	18	18	26	X	X	X	X				
1314	24	24	35	X	X	X	X				
1314A	30	30	43	X	X	X	X				
1315	36	36	52	X	X	X	X	X	X	X	X
1318	45	45	65				X	X	X	X	X
1319	60	60	87					X	X	X	X
1319	60	60	87								X
1319A	80	80	115								

Three-phase power supply with star connection, no neutral

Note: The possible combinations are marked with an **X**

STEAM HUMIDIFIER (Accessory)**Combinations units / humidifier**

HUMIDIFIER					UNIT SIZE									
Option code	Size	Steam production [kg/h]	Power input [kW]	Absorbed current [A]	0264	0304	0354	0404	0444	0484	0524	0604	0524	0604
4303	UM 08	8	6	8,66	X	X								
4304	UM 10	10	7,4	10,68	X	X	X	X	X	X	X	X		
4305	UM 15	15	11,2	16,17	X	X	X	X	X	X	X	X		
4306	UM 25	25	18,6	26,85	X	X	X	X	X	X	X	X	X	X
4307	UM 35	35	26,1	37,67			X	X	X	X	X	X	X	X
4308	UM 45	45	33,5	48,35			X	X	X	X	X	X	X	X

Three-phase power supply with star connection, no neutral

Note: The possible combinations are marked with an **X**

GAS-FIRED HEATING MODULE (Accessory)**Heating performance**

STEPS gas heating module		MT-S 50		MT-S 70		MT-S 100		MT-S 150		MT-S 200		MT-S 300	
Rated thermal input (Hi) min/max	[kW]	42,4	52,2	60	73,5	81,8	100	60	147	81,8	200	76,8	184,6
Rated thermal output min/max	[kW]	39,6	47,9	56,2	67,5	76,8	92,3	56,2	135	76,8	184,6	81,8	300
Efficiency hi (P.C.I.) min/max	[%]	93,4	91,8	93,7	91,8	93,9	92,3	93,7	91,8	93,9	92,3	93,9	92,3
Efficiency hs (P.C.S) min/max	[%]	84,1	82,6	84,3	82,6	84,5	83,1	84,3	82,6	84,5	83,1	84,5	83,1
Number of burners	[No.]	1		1		1		2		2		3	
Supply pressure (G20)	[mbar]	20 [min 15-max 25]											
Gas consumption (G20) min/max	[m³/h]	4,49	5,52	6,35	7,78	8,66	10,58	6,35	15,56	8,66	21,16	8,66	31,74
Supply pressure (G30)	[mbar]	30 [min 25-max 35] - 50 [min 42,5-max 57,5]											
Gas consumption (G30) min/max	[kg/h]	3,3	4,33	4,98	6,1	6,97	8,63	4,98	12,2	6,97	17,26	6,97	25,89
Supply pressure (G31)	[mbar]	30 [min 25-max 35] - 37 [min 25-max 45] - 50 [min 42,5-max 57,5]											
Gas consumption (G31) min/max	[kg/h]	3,47	4,27	4,91	6,01	6,69	8,18	4,91	12,02	6,69	16,36	6,69	24,54

MODULATING gas heating module		MT-M 40		MT-M 60		MT-M 80		MT-M 130		MT-M 160		MT-M 200		MT-M 300	
Rated thermal output min/max	[kW]	9	40,4	13,4	62,93	17,77	80,03	13,4	125,86	17,77	160,06	22,8	194,3	22,77	291,45
Rated thermal input (Hi) min/max	[kW]	8,5	42	12,4	65	16,4	82	12,4	130	16,4	164	21	200	21	300
Efficiency hi (P.C.I.) min/max	[%]	105,88	96,19	108,06	96,82	108,35	97,6	108,1	96,8	108,35	97,6	108,4	97,2	108,4	97,2
Efficiency hs (P.C.S) min/max	[%]	95,39	86,66	97,36	87,22	97,62	87,93	97,4	87,2	97,62	87,93	97,7	87,5	97,7	87,5
Number of burners	[No.]	1		1		1		2		2		2		3	
Supply pressure (G20)	[mbar]	20 [min 17-max 25]													
Gas consumption (G20) min/max	[m³/h]	0,9	4,44	1,31	6,88	1,74	8,68	1,31	13,76	1,74	17,36	1,9	21,2	1,9	31,8
Supply pressure (G30)	[mbar]	30 [min 25-max 35] - 50 [min 42,5-max 57,5]													
Gas consumption (G30) min/max	[kg/h]	0,71	3,49	1,03	5,39	1,49	6,8	1,31	10,78	1,49	13,6	1,7	16,6	1,7	24,9
Supply pressure (G31)	[mbar]	30 [min 25-max 35] - 37 [min 25-max 45] - 50 [min 42,5-max 57,5]													
Gas consumption (G31) min/max	[kg/h]	0,7	3,43	1,01	5,31	1,34	6,7	1,31	10,62	1,34	13,4	1,47	16,36	1,47	24,54

Possible combinations

Option code	Description	0264	0304	0354	0404	0444	0484	0524	0604
1652	STEPS HEATING MOD. MT-S 50								
1653	STEPS HEATING MOD. MT-S 70								
1654	STEPS HEATING MOD. MT-S 100								
1655	STEPS HEATING MOD. MT-S 150	X	X	X	X				
1656	STEPS HEATING MOD. MT-S 200	X	X	X	X	X	X	X	X
1656A	STEPS HEATING MOD. MT-S 300					X	X	X	X
1642	MODULATING HEAT. MOD. MT-M 40								
1643	MODULATING HEAT. MOD. MT-M 60								
1644	MODULATING HEAT. MOD. MT-M 80								
1645A	MODULATING HEAT. MOD. MT-M 130	X	X	X	X				
1646	MODULATING HEAT. MOD. MT-M 160	X	X	X	X	X	X	X	X
1647	MODULATING HEAT. MOD. MT-M 200	X	X	X	X	X	X	X	X
1647A	MODULATING HEAT. MOD. MT-M 300					X	X	X	X

Note: The possible combinations are marked with an X

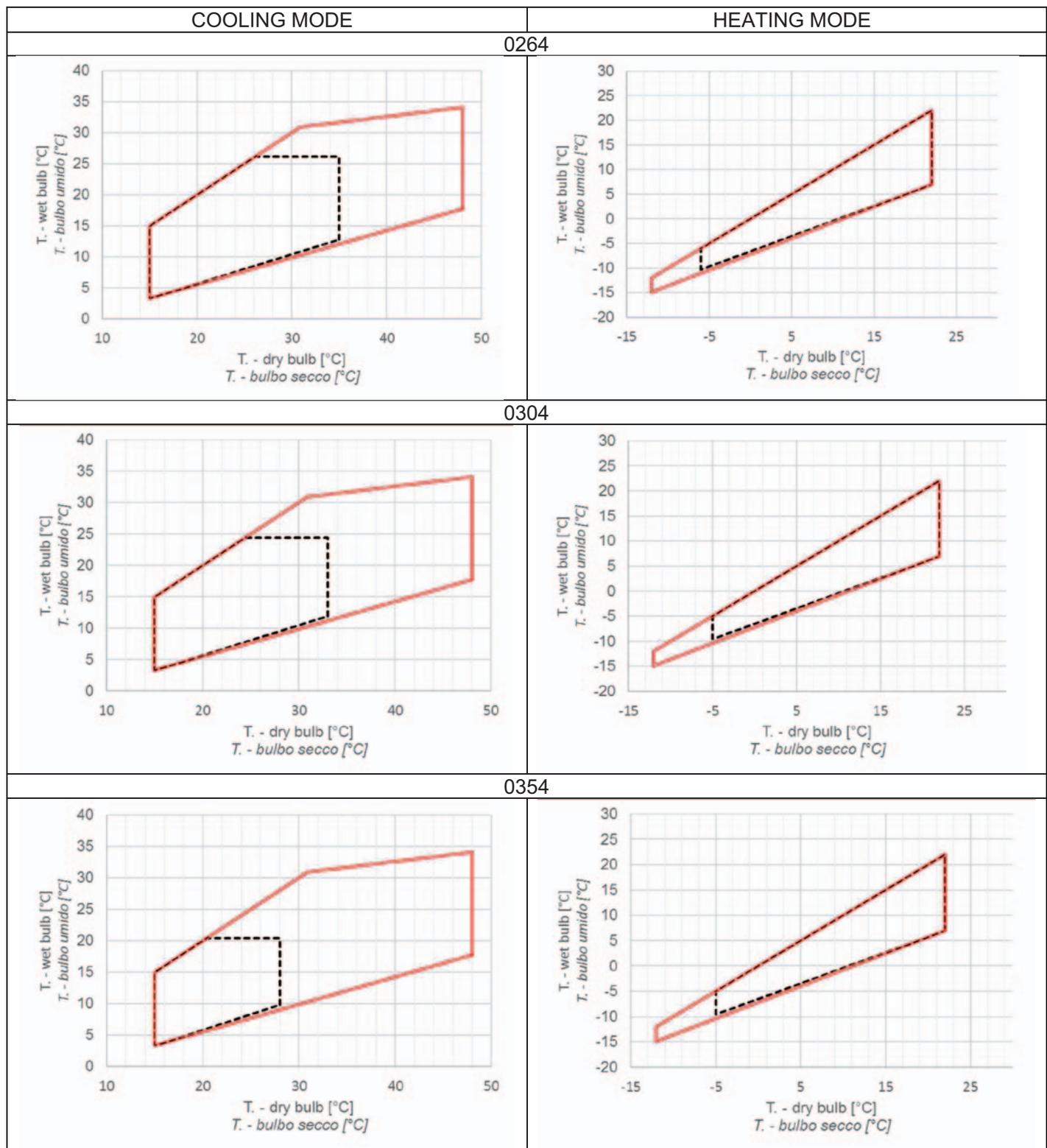
7. OPERATING LIMITS FOR EACH SIZE

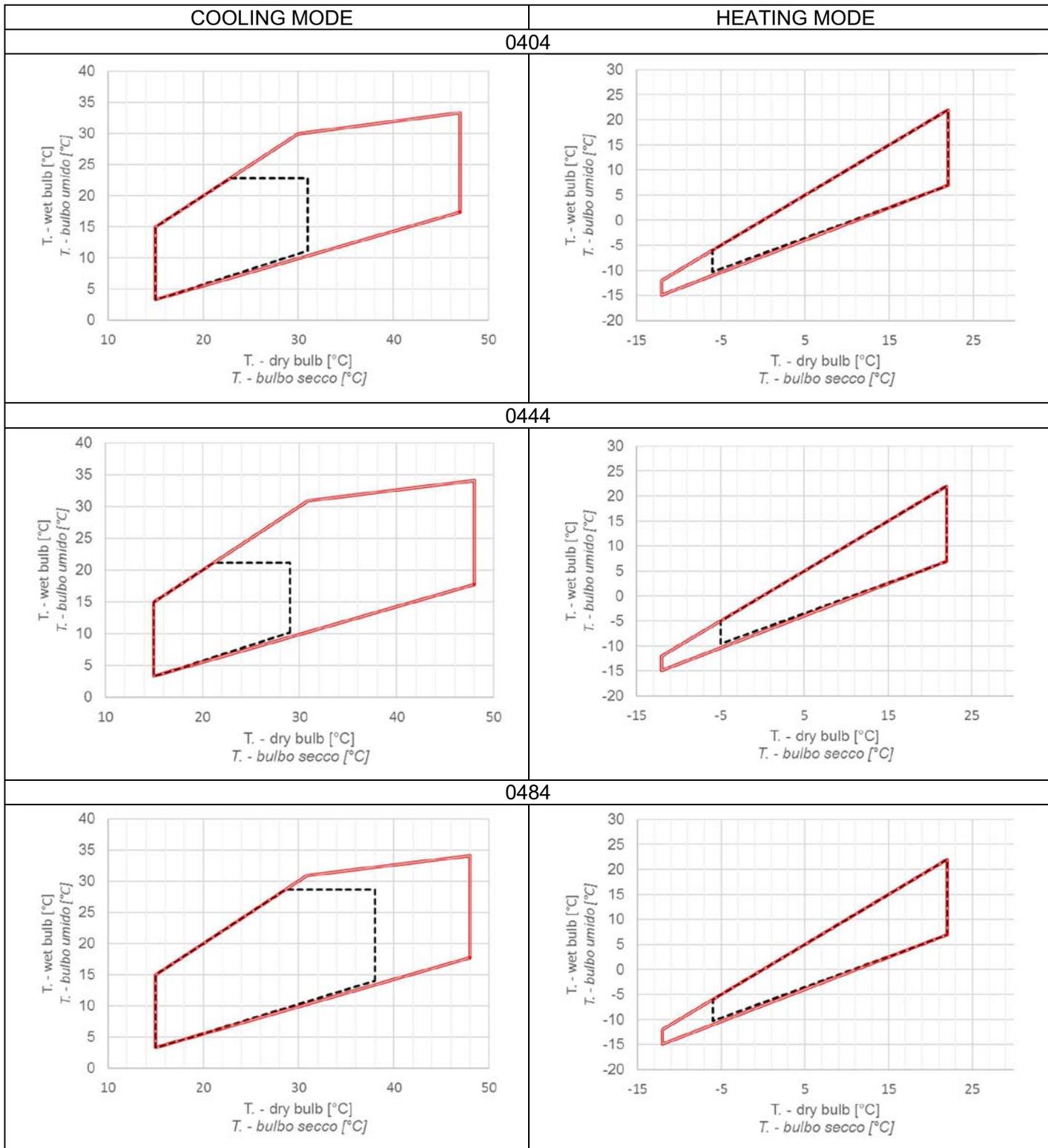
OPERATING LIMITS CALCULATED IN THE FOLLOWING CONDITIONS:

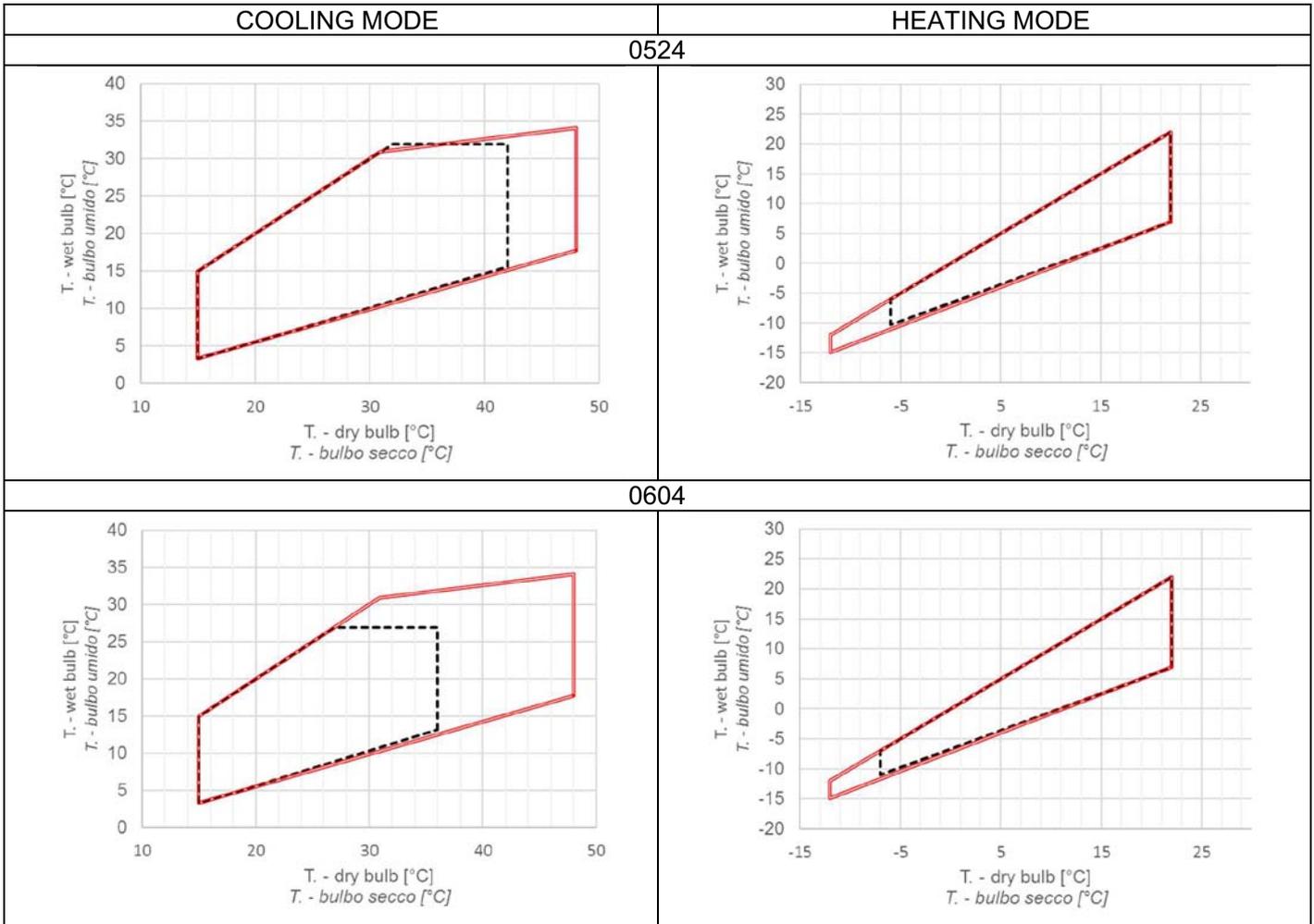
- Max air flow
- Unit correctly installed and used
- Operating in stable conditions

Warning: When unit is installed in very hot climate (external temperature goes up to 46°C), it's suggested to use 411 - Electric panel with forced ventilation

- External air temperature limit
- - - - Treatment coil entering air temperature limit







8. DIMENSIONAL DRAWINGS

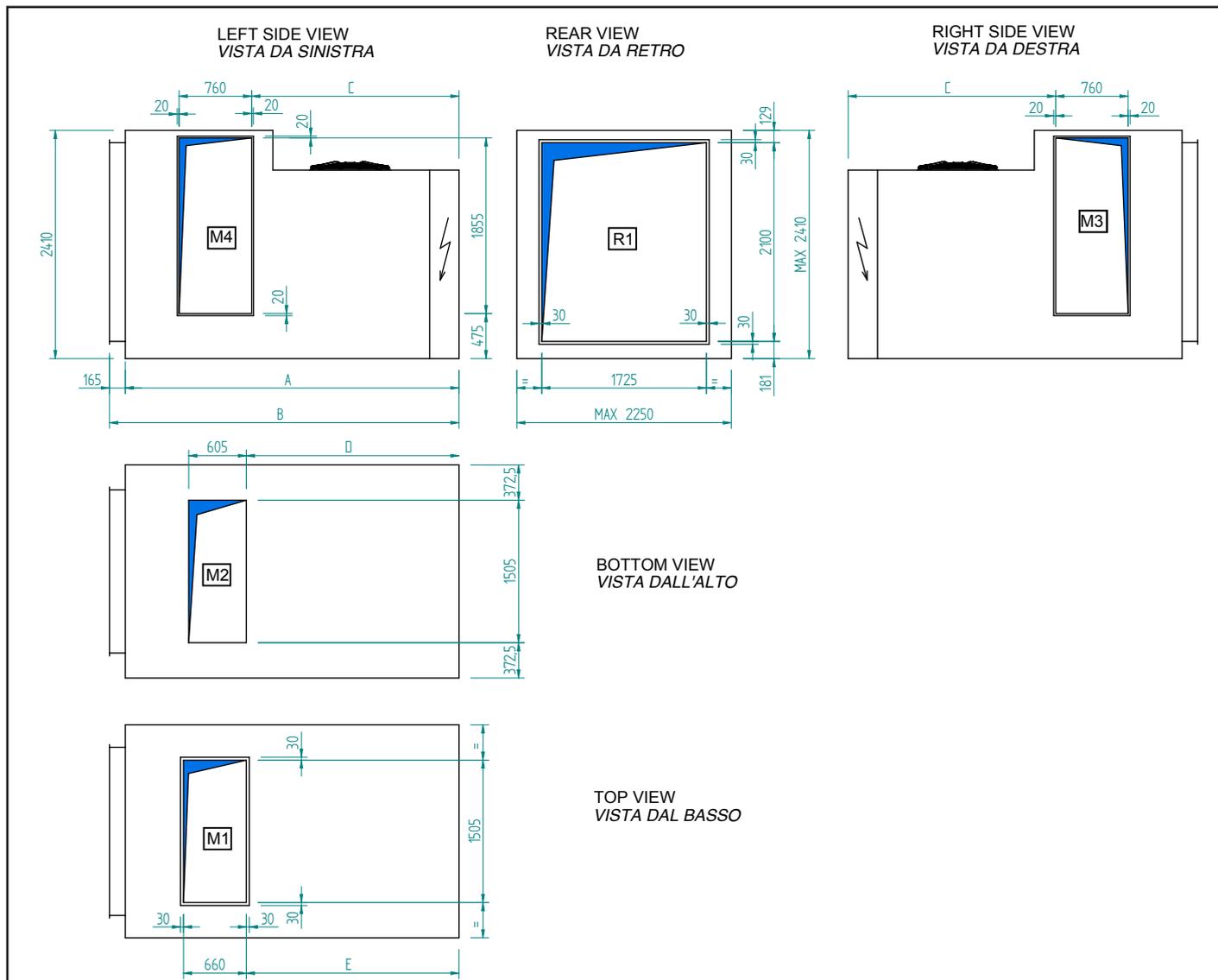
Remarks: for installation purposes, please refer to the documentation sent after the purchase-contract. This technical data should be considered as indicative. Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A. may modify them at any moment. Data valid for standard units without any additional option.

Legend symbols

SUPPLY AIR DIRECTION		
LIST CODE	DESCRIPTION	ICON
2072	BOTTOM SIDE SUPPLY AIR	M1
2075	TOP SIDE SUPPLY AIR	M2
2076	RIGHT SIDE SUPPLY AIR	M3
2077	LEFT SIDE RETURN AIR	M4

RETURN AIR DIRECTION		
LIST CODE	DESCRIPTION	ICON
2061	REAR SIDE RETURN AIR	R1
2062	RIGHT SIDE RETURN AIR	R2
2063	BOTTOM SIDE RETURN AIR	R3
2065	LEFT SIDE RETURN AIR	R4
2067	TOP SIDE RETURN AIR	R5

WSM2/ AR



AR	Size	Dimensions							
		A	B				C	D	E
			BASIC UNIT	+ FT (1)	+ UM (1)	+ MT (1)			
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
	0264 ÷ 0404	3.500	3.665	+ 650	+ 650	+ 1300	2.175	2.230	2.230
	0444 ÷ 0604	4.300	4.465	+ 650	+ 650	+ 1300	2.975	3.030	3.030

(1): The length shown in this column represents the increase in length (B dimension) due to accessories:

- FT = bag/electronic filter (options 2521-2521A-2524)
- UM = Humidifier (options 4303-4304-4305-4306-4307-4308)
- MT = Heating module (options 1645A - 1646 - 1647 - 1647A - 1655 - 1656 - 1656A)

DIMENSIONAL DRAWINGS

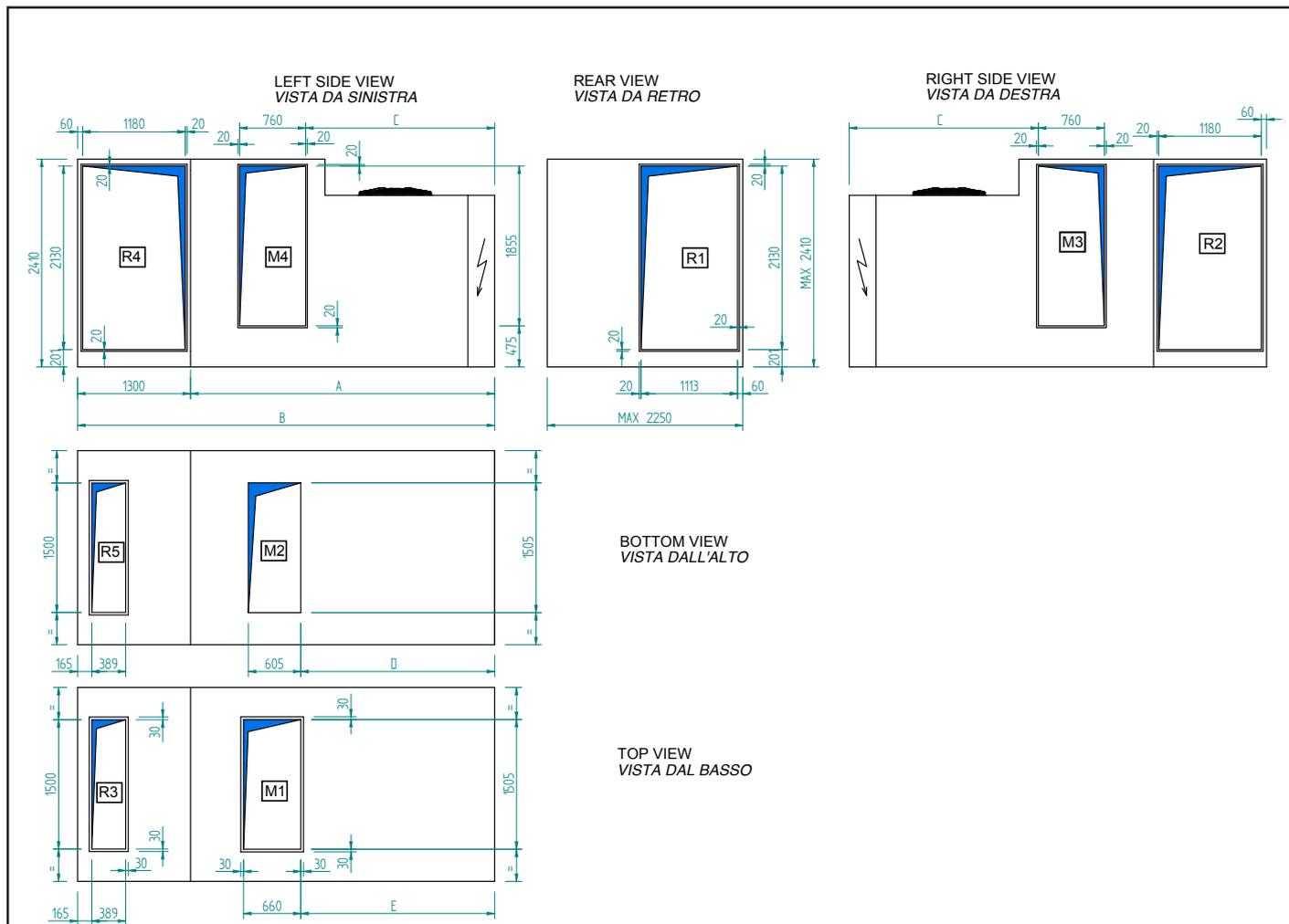
Remarks: for installation purposes, please refer to the documentation sent after the purchase-contract. This technical data should be considered as indicative. Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A. may modify them at any moment. Data valid for standard units without any additional option.

Legend symbols

SUPPLY AIR DIRECTION		
LIST CODE	DESCRIPTION	ICON
2072	BOTTOM SIDE SUPPLY AIR	M1
2075	TOP SIDE SUPPLY AIR	M2
2076	RIGHT SIDE SUPPLY AIR	M3
2077	LEFT SIDE RETURN AIR	M4

RETURN AIR DIRECTION		
LIST CODE	DESCRIPTION	ICON
2061	REAR SIDE RETURN AIR	R1
2062	RIGHT SIDE RETURN AIR	R2
2063	BOTTOM SIDE RETURN AIR	R3
2065	LEFT SIDE RETURN AIR	R4
2067	TOP SIDE RETURN AIR	R5

WSM2/ MF



MF	Size	Dimensions							
		A	B			C	D	E	
			BASIC UNIT	+ FT (1)	+ UM (1)				+ MT (1)
	0264 ÷ 0404	3.500	4.800	+ 0	+ 650	+ 1300	2.175	2.230	2.230
	0444 ÷ 0604	4.300	5.600	+ 0	+ 650	+ 1300	2.975	3.030	3.030

(1): The length shown in this column represents the increase in length (B dimension) due to accessories:

- FT = bag/electronic filter (options 2521-2521A-2524)
- UM = Humidifier (options 4303-4304-4305-4306-4307-4308)
- MT = Heating module (options 1645A - 1646 - 1647 - 1647A - 1655 - 1656 - 1656A)

DIMENSIONAL DRAWINGS

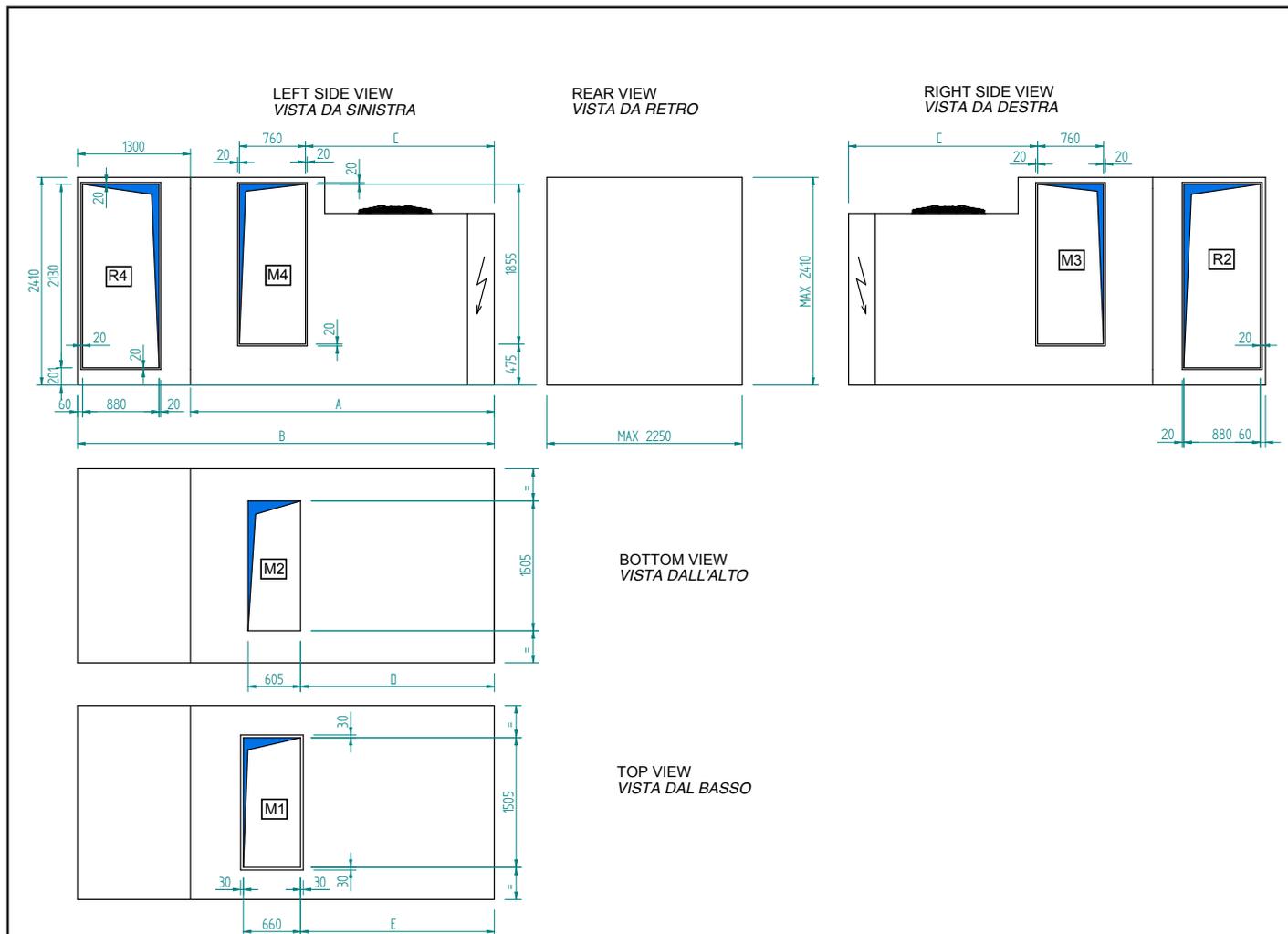
Remarks: for installation purposes, please refer to the documentation sent after the purchase-contract. This technical data should be considered as indicative. Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A. may modify them at any moment. Data valid for standard units without any additional option.

Legend symbols

SUPPLY AIR DIRECTION		
LIST CODE	DESCRIPTION	ICON
2072	BOTTOM SIDE SUPPLY AIR	M1
2075	TOP SIDE SUPPLY AIR	M2
2076	RIGHT SIDE SUPPLY AIR	M3
2077	LEFT SIDE RETURN AIR	M4

RETURN AIR DIRECTION		
LIST CODE	DESCRIPTION	ICON
2061	REAR SIDE RETURN AIR	R1
2062	RIGHT SIDE RETURN AIR	R2
2063	BOTTOM SIDE RETURN AIR	R3
2065	LEFT SIDE RETURN AIR	R4
2067	TOP SIDE RETURN AIR	R5

WSM2/ AX



AX	Size	Dimensions							
		A	B				C	D	E
			BASIC UNIT	+ FT (1)	+ UM (1)	+ MT (1)			
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
	0264 ÷ 0404	3.500	4.800	+ 0	+ 650	+ 1300	2.175	2.230	2.230
	0444 ÷ 0604	4.300	5.600	+ 0	+ 650	+ 1300	2.975	3.030	3.030

(1): The length shown in this column represents the increase in length (B dimension) due to accessories:
 - FT = bag/electronic filter (options 2521-2521A-2524)
 - UM = Humidifier (options 4303-4304-4305-4306-4307-4308)
 - MT = Heating module (options 1645A - 1646 - 1647 - 1647A - 1655 - 1656 - 1656A)

DIMENSIONAL DRAWINGS

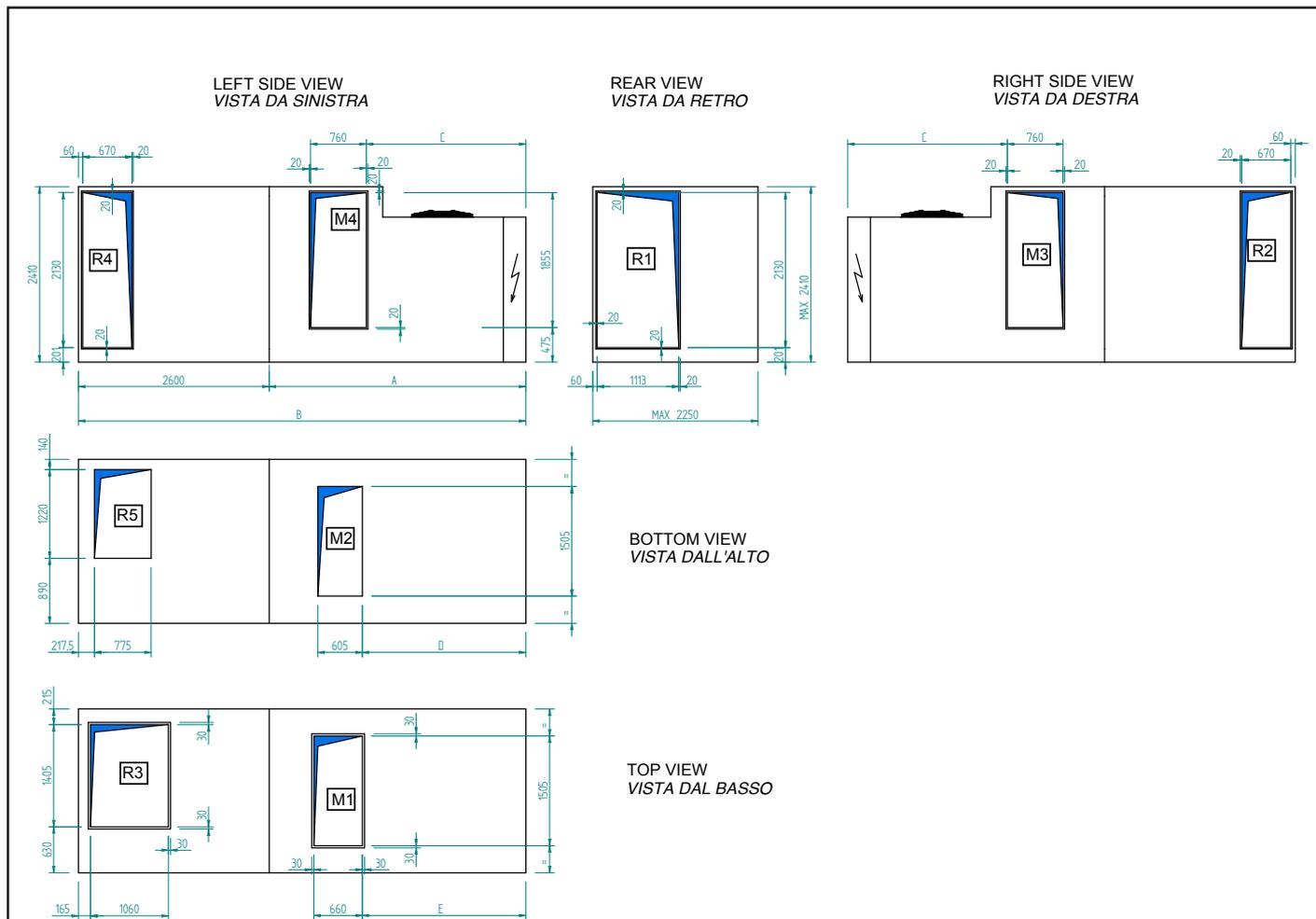
Remarks: for installation purposes, please refer to the documentation sent after the purchase-contract. This technical data should be considered as indicative. Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A. may modify them at any moment. Data valid for standard units without any additional option.

Legend symbols

SUPPLY AIR DIRECTION		
LIST CODE	DESCRIPTION	ICON
2072	BOTTOM SIDE SUPPLY AIR	M1
2075	TOP SIDE SUPPLY AIR	M2
2076	RIGHT SIDE SUPPLY AIR	M3
2077	LEFT SIDE RETURN AIR	M4

RETURN AIR DIRECTION		
LIST CODE	DESCRIPTION	ICON
2061	REAR SIDE RETURN AIR	R1
2062	RIGHT SIDE RETURN AIR	R2
2063	BOTTOM SIDE RETURN AIR	R3
2065	LEFT SIDE RETURN AIR	R4
2067	TOP SIDE RETURN AIR	R5

WSM2/ CE/HR-B/HR-E



CE/HR-B/ HR-E	Size	Dimensions							
		A	B			C	D	E	
			BASIC UNIT	+ FT (1)	+ UM (1)				+ MT (1)
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
	0264 ÷ 0404	3.500	6.100	+ 0	+ 650	+ 1300	2.175	2.230	2.230
	0444 ÷ 0604	4.300	6.900	+ 0	+ 650	+ 1300	2.975	3.030	3.030

(1): The length shown in this column represents the increase in length (B dimension) due to accessories:

- FT = bag/electronic filter (options 2521-2521A-2524)
- UM = Humidifier (options 4303-4304-4305-4306-4307-4308)
- MT = Heating module (options 1645A - 1646 - 1647 - 1647A - 1655 - 1656 - 1656A)

DIMENSIONAL DRAWINGS

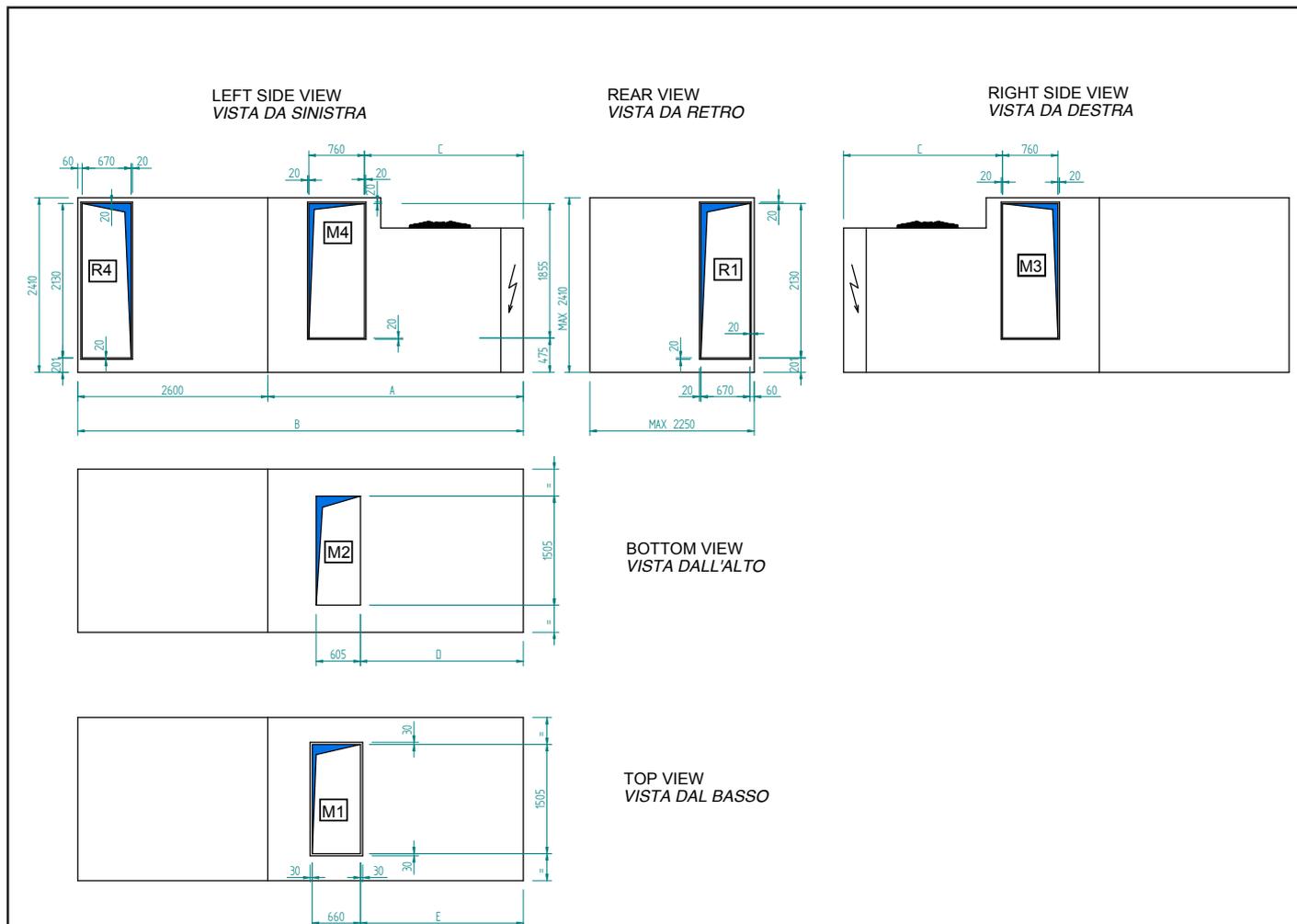
Remarks: for installation purposes, please refer to the documentation sent after the purchase-contract. This technical data should be considered as indicative. Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A. may modify them at any moment. Data valid for standard units without any additional option.

Legend symbols

SUPPLY AIR DIRECTION		
LIST CODE	DESCRIPTION	ICON
2072	BOTTOM SIDE SUPPLY AIR	M1
2075	TOP SIDE SUPPLY AIR	M2
2076	RIGHT SIDE SUPPLY AIR	M3
2077	LEFT SIDE RETURN AIR	M4

RETURN AIR DIRECTION		
LIST CODE	DESCRIPTION	ICON
2061	REAR SIDE RETURN AIR	R1
2062	RIGHT SIDE RETURN AIR	R2
2063	BOTTOM SIDE RETURN AIR	R3
2065	LEFT SIDE RETURN AIR	R4
2067	TOP SIDE RETURN AIR	R5

WSM2/ HR-P



HR-P	Size	Dimensions							
		A	B			C	D	E	
			BASIC UNIT	+ FT (1)	+ UM (1)				+ MT (1)
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
	0264 ÷ 0404	3.500	6.100	+ 0	+ 650	+ 1300	2.175	2.230	2.230
	0444 ÷ 0604	4.300	6.900	+ 0	+ 650	+ 1300	2.975	3.030	3.030

(1): The length shown in this column represents the increase in length (B dimension) due to accessories:

- FT = bag/electronic filter (options 2521-2521A-2524)
- UM = Humidifier (options 4303-4304-4305-4306-4307-4308)
- MT = Heating module (options 1645A - 1646 - 1647 - 1647A - 1655 - 1656 - 1656A)



for a greener tomorrow

Eco Changes is the Mitsubishi Electric Group's environmental statement, and expresses the Group's stance on environmental management. Through a wide range of businesses, we are helping contribute to the realization of a sustainable society.



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