EtaMax

Air handling unit for all fresh air with high energy efficiency.
Air flow rates from 4.000 to 25.000 m³/h.

The units of the EtaMax series represent the maximum expression of the technological innovation in all fresh air handling. The EtaMax series has been specifically designed in order to reduce to the minimum the energy consumptions during operation, which represent about 80% of the whole Life Cycle Cost (L.C.C.) of an air handling unit. The double heat recovery system (static and active) and the innovative adiabatic cooling and humidifying system allow to bring the air to the desired supply conditions into the room with the minimum energetic consumption.
The presence of a total by-pass damper allows the free-cooling in the intermediate seasons, taking the maximum advantage of the free thermal loads of the external air. The EtaMax series is manufactured in full compliance with the EN1886 norm for what concerns the mechanical resistance, the limited air leakage, the thermal and acoustic insulation of the casing.

>Versions

5 available sizes
EtaMax Std: standard version, with double static and active heat recovery system, adiabatic cooling and humidification systems.
EtaMax Eco: version with recirculation damper
EtaMax Dry: version with hot gas re-heating coil, in combination with floor heating systems
Plug and play: the unit is supplied complete with automatics and controls, cooling circuit completely wired and assembled in order to minimize the installation costs and times.
Bearing frame
Sandwich panels with 50mm thickness
Wide choice of accessories

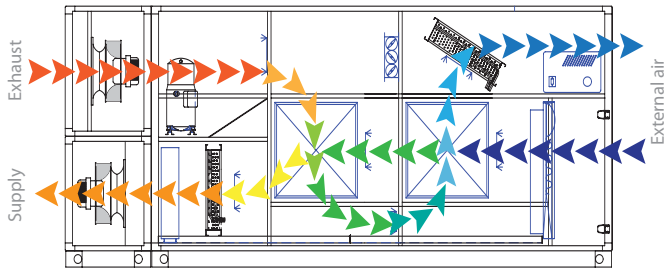
high efficiency

>Main technical data

EtaMax		040	060	100	160	250
Nominal air flow rate	m³/h	4.000	6.000	10.000	16.000	25.000
Minimum air flow rate	m³/h	2.800	4.200	7.000	11.200	17.500
Max . capacity standard fans	kW	2,2	3	5,5	7,5	15
Absorbed current at max. capacity	A	4	5,4	9,9	13,5	27,1
Supply available pressure	Pa	300	300	300	300	300
Exhaust available pressure	Pa	200	200	200	200	200
Max. capacity powered fans	kW	3	4	7,5	11	15
Supply available pressure	Pa	500	500	500	500	500
Exhaust available pressure	Pa	400	400	400	400	400
Static recovery capacity [1]	kW	16,2	23,4	38	63,3	100,8
Static heat recuperator efficiency [1]	%	75,4	72,3	71,3	74,0	75,4
Active heat recovery system cooling capacity [1]	kW	19,1	27,8	45,6	73,8	97,6
Compressors absorbed power [1]	kW	7,3	9,4	15,3	22	25
Compressors absorbed current [1]	A	13,8	13,2	24,12	32,5	37
Total E.E.R. [1]		3,5	3,8	3,8	4,1	4,4
Static recovery capacity [2]	kW	12,5	21,9	35,6	59,2	94,24
Static heat recuperator efficiency [2]	%	76,6	74	72,1	74,8	76,2
Active heat recovery system heating capacity [2]	kW	24,2	32,1	56,8	84,6	109,8
Compressors absorbed power [2]	kW	7,4	8,0	17,8	19,1	22,6
Compressors absorbed current [2]	A	15,9	11,3	29,1	29,2	34,7
Total C.O.P. [2]		3,9	4,5	3,9	4,7	4,8
Type of compressors / n.		Scroll / 1		Scroll / 2		
Power Supply		400V / 3Ph+N / 50Hz				
Pump capacity - adiabatic cooling circuit	kW	0,46	0,46	0,46	0,69	0,69
Humidification capacity	g/kg	5	5	5	5	5
Water flow	kg/h	8	12	20	32	50
Watr coil heating capacity [3]	kW	25,4	33,9	60,7	102,0	133,6
Water flow	m³/h	1,09	1,50	2,60	4,38	5,87
Water side pressure drop	kPa	8	6	9	8	7
Air side pressure drop	Pa	28	41	33	52	80

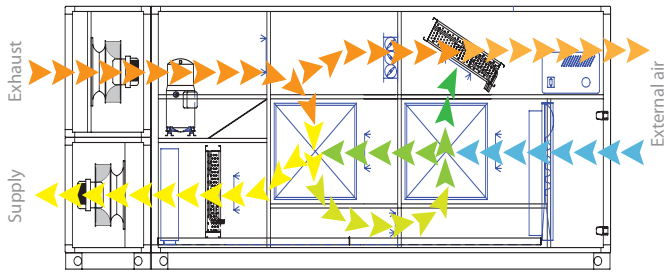
1 External air 35°C, RH 40%; exhaust air 27°C, RH 47,5%, adiabatic cooling active.
2 External air 7°C, RH 87%; exhaust air 20°C, RH 60%, adiabatic humidification active.
3 Water inlet 70°C, water oulet 50°C.
Technical data subject to change.

>Operating Schemes - EtaMax Std



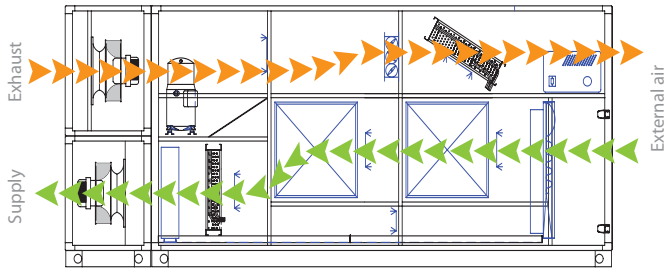
Winter operation

The exhaust air crosses the two-stages heat recovery unit, releasing the heat to the external fresh air; the leftover heat in the air is released to the evaporator of the heat pump. The external fresh air is first heated up when crossing the recovery units and reheated up to the desired conditions to the room supply by the condenser of the heat pump and by the water reheating coil (optional).



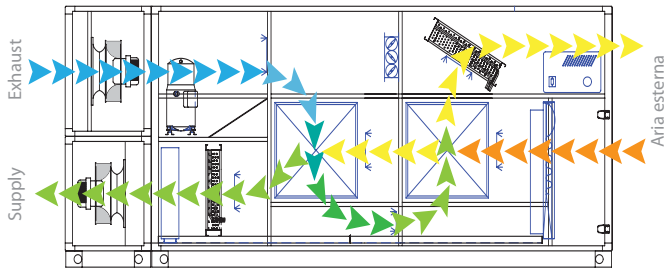
Operation in intermediate seasons (free cooling with partial bypass)

The exhaust air is partly conveyed outside through a bypass damper and partly sent across the heat recovery units, when it releases heat to the fresh air flow.



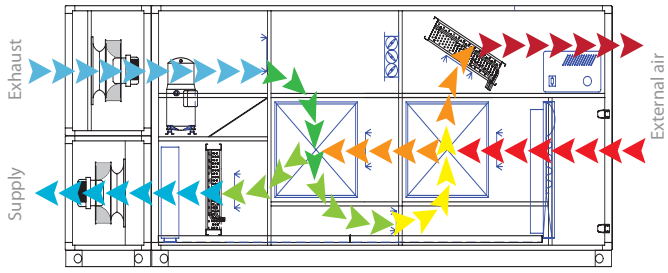
Operation in intermediate seasons (free cooling with total bypass)

The exhaust air is conveyed directly outside though a bypass damper and does not cross the heat recovery units. The fresh air is taken from the outside and supplied directly into the room.



Operation in intermediate seasons (adiabatic cooling)

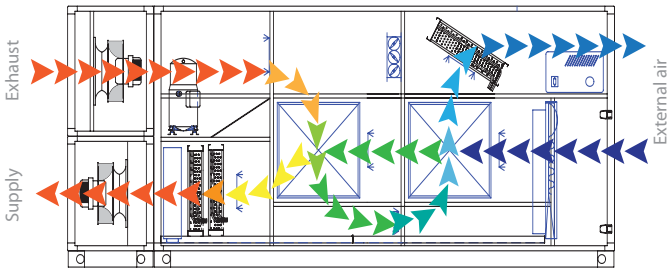
The exhaust air is cooled with an adiabatic system and crosses the recovery units, where it removes the heat from the fresh air flow. Thanks to this operating mode the energetic efficiency is maximized, as the cooling is obtained without the intervention of the cooling circuit



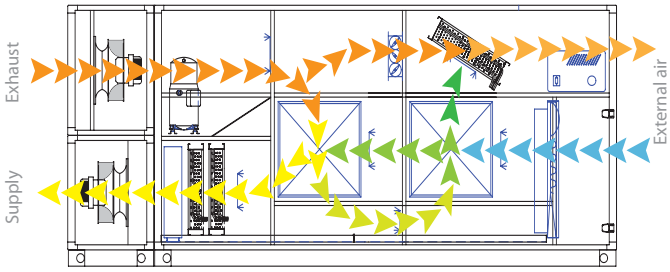
Summer operation (elevate external temperatures)

The exhaust air is cooled with an adiabatic system and crosses the recovery units, where it removes the heat from the fresh air flow. The fresh air is cooled down both by the heat exchange in the plate recovery units, and by the evaporating coil in the cooling circuit

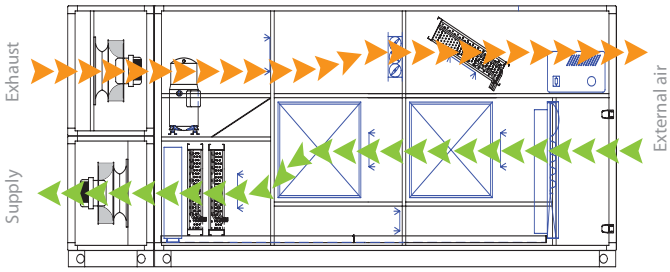
>Operating Schemes - EtaMax Dry



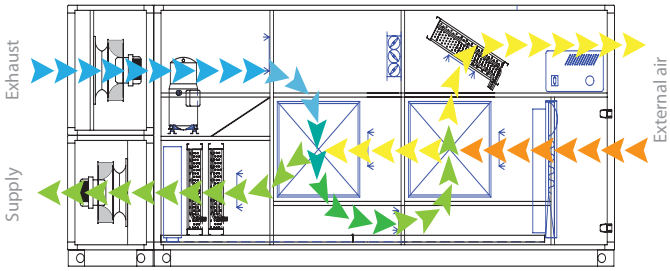
Winter operation
The exhaust air crosses the two-stages heat recovery unit, releasing the heat to the external fresh air; the leftover heat in the air is released to the evaporator of the heat pump. The external fresh air is first heated up when crossing the recovery units and reheated up to the desired conditions to the room supply by the condenser of the heat pump and by the hot gas reheating coil (standard).



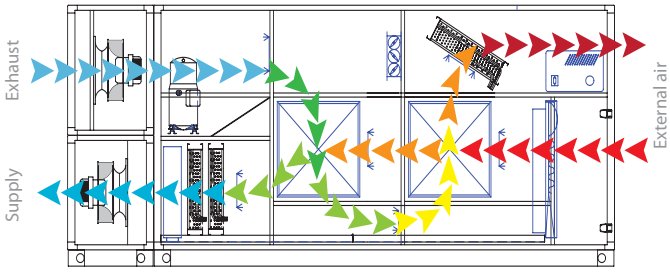
Operation in intermediate seasons (free cooling with partial bypass)
The exhaust air is partly conveyed outside though a bypass damper and partly sent across the heat recovery units, when it releases heat to the fresh air flow.



Operation in intermediate seasons (free cooling with total bypass)
The exhaust air is conveyed directly outside though a bypass damper and does not cross the heat recovery units. The fresh air is taken from the outside and supplied directly into the room.

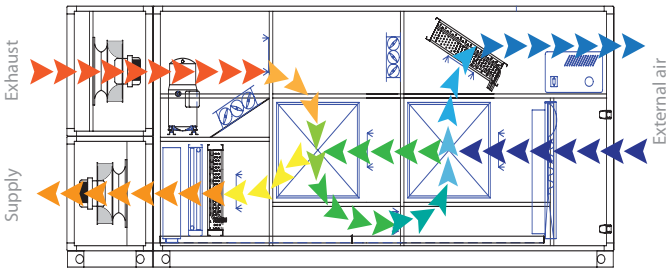


Operation in intermediate seasons (adiabatic cooling)
The exhaust air is cooled with an adiabatic system and crosses the recovery units, where it removes the heat from the fresh air flow. In this operating mode the energetic efficiency is maximized, in that the cooling is obtained without the intervention of the cooling circuit.



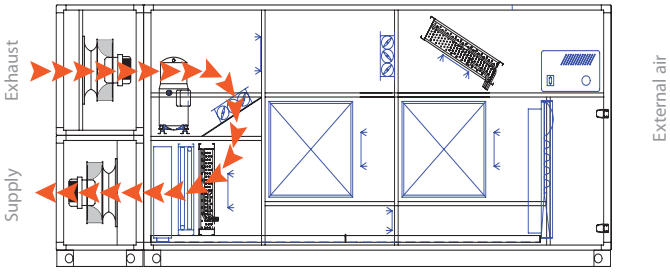
Summer operation (elevate external temperatures)
The exhaust air is cooled with an adiabatic system and crosses the recovery units, where it removes the heat from the fresh air flow. The fresh air is cooled down both by the heat exchange in the plate recovery units, and by the evaporating coil in the cooling circuit. It is possible to tune finely the supply air temperature thanks to the hot gas reheating coil (standard).

>Operating Schemes - EtaMax Eco



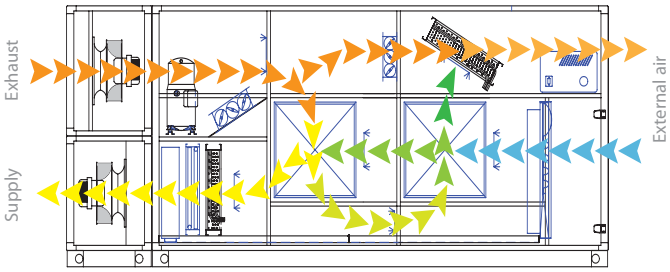
Winter operation

The exhausted air crosses the two-stages heat recovery unit, releasing the heat to the external fresh air; the leftover heat in the air is released to the evaporator of the heat pump. The external fresh air is first heated up when crossing the recovery units and reheated up to the desired conditions to the room supply by the condenser of the heat pump and by the water reheating coil (optional).



Winter operation (total recirculation)

In order to bring the room air as quickly as possible to the desired temperature, at the start-up of the unit all the air volume is recirculated (open recirculation damper) and sent to the water reheating coil (optional).



Operation in intermediate seasons (free cooling with partial bypass)

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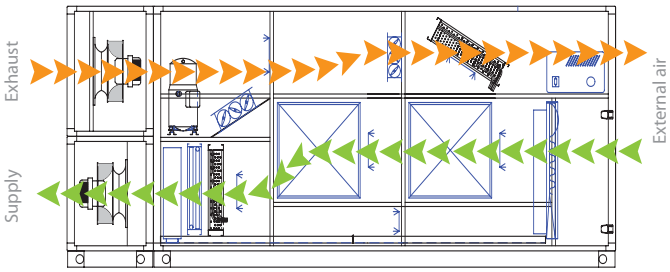

Operation in intermediate seasons (free cooling with total bypass)

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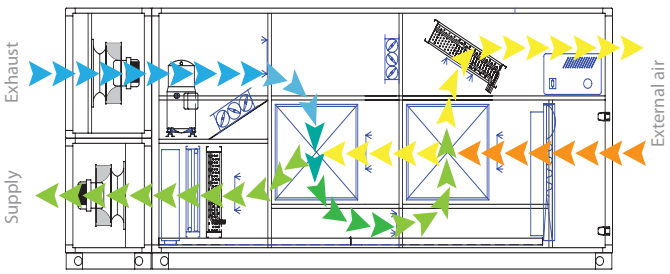
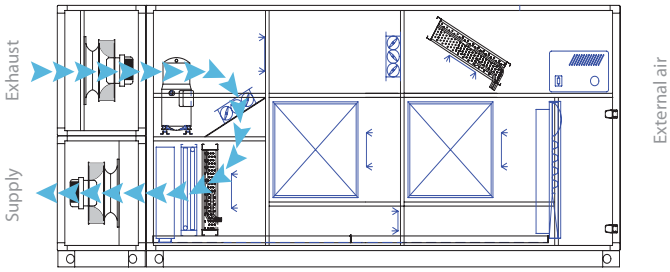


Operation in intermediate seasons (adiabatic cooling)

The exhaust air is cooled with an adiabatic system and crosses the recovery units, where it removes the heat from the fresh air flow. In this operating mode the energetic efficiency is maximized, in that the cooling is obtained without the intervention of the cooling circuit.



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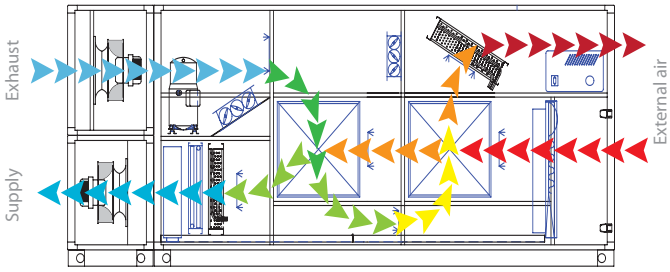
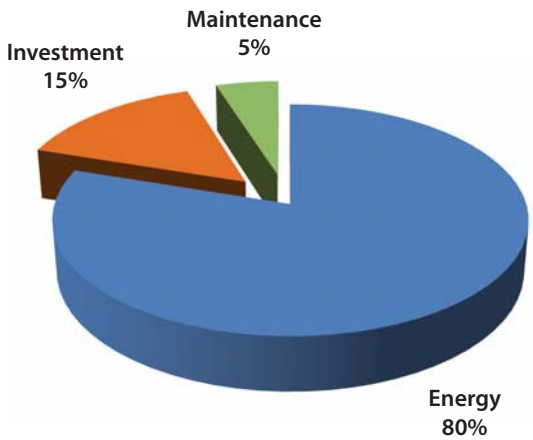


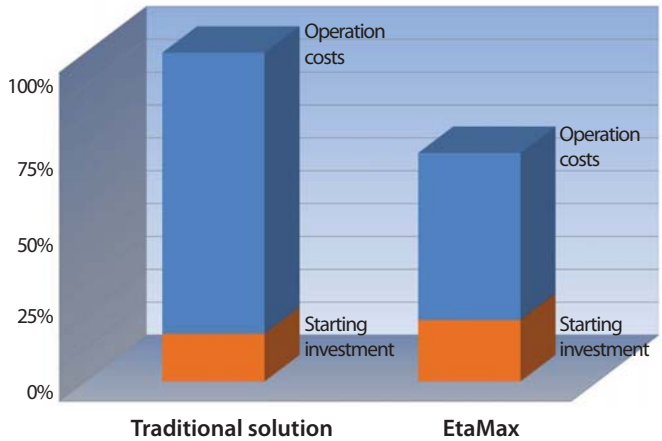
Summer operation (elevate external temperatures)
The exhaust air is cooled with an adiabatic system and crosses the recovery units, where it removes the heat from the fresh air flow. The fresh air is cooled down both by the heat exchange in the plate recovery units, and by the evaporating coil in the cooling circuit. It is possible to tune finely the supply air temperature thanks to the hot gas reheating coil (standard).

>LCC Analysis (Life Cycle Cost)

TThe LCC analysis of an air handling unit shows how the initial investment costs accounts for approximately only 15% of the global cost of the whole life cycle cost of the unit; thus , the remaining 80% is due mainly to energy costs deriving from the use of the air handling unit and, just marginally, by the maintenance costs. It is therefore almost mandatory to choose units with very low energy consumption in order to achieve an effective and remarkable energetic and economic saving along the whole life cycle of the unit.

The following LCC simulation* shows how the adoption of the EtaMax all fresh air handling unit allows to achieve a remarkable energetic saving and, consequently, economic during the whole life cycle of the unit





* The simulation is referred to average climatic conditions of Bolzano (Northern Italy). The data are indicative and refer to a life cycle of 10 years.

>Characteristics

Plug and play: tthe EtaMax units are supplied ready to use. In particular, the unit is equipped with a complete control system and the cooling circuit is entirely tested and connected, thus minimizing the costs for the installation and commissioning.

Bearing frame in aluminium profiles with new geometry and rounded corners, with nylon-reinforced corner pieces. The casing is made from sandwich panels, 50mm thick, fixed to the frame with exclusive locking profiles without any screw. This fixing system allows for a uniform pressure on the casing, granting a premium seal to air (class B – EN 1886) and water leakages.

Modulating by-pass damper in aluminium with airfoil opposed blades, placed in the exhaust line to allow for the free-cooling option. Additional recirculation damper (only in the Eco version).
The accurate manufacturing permits to reduce the air leakages to the minimum.

Centrifugal fans with double inlet, backward-curved blades, with high efficiency. Electric motors with high efficiency (class EFF1). Frequency inverters for the continuous control of the air volume both in supply and in exhaust (optional). Upon request, direct coupled plug-fans with very elevate efficiency are also available.

Filters: several types of filters are available (pre-filters, bag filters), in order to satisfy the different filtration requirements and grating the compliance to the norms in force, concerning the air quality in the room. A pressure switch for the filters clogging is standard.

Static heat recovery unit: cross-flow heat recovery unit in two stages, high-efficiency, in aluminium.
An anti-freeze sensor is supplied as standard.

Active heat recovery unit: integrated reversible heat pump.
Tandem scroll compressors (single for the sizes 040 and 060) equipped with anti-vibration dampers; stepless cooling capacity control with a frequency inverter, in order to ensure the maximum energy saving even at part load operations. Double thermostatic valve with electronic control. 4-way cycle inversion valve.
Heat exchangers made from copper pipes and aluminium fins. Ecological refrigerant R410A, which grants at the same time the respect of the environment and the increase of the energy efficiency of the cooling circuit.

Re-heating coil with water in the versions Std and Eco (optional), and with hot gas in the Dry version (standard).

Adiabatic cooling system with atomized water in the exhaust air flow, with self-cleaning atomizing nozzles and high pressure pumping station, aiming at optimizing the heat exchange in the double recuperator

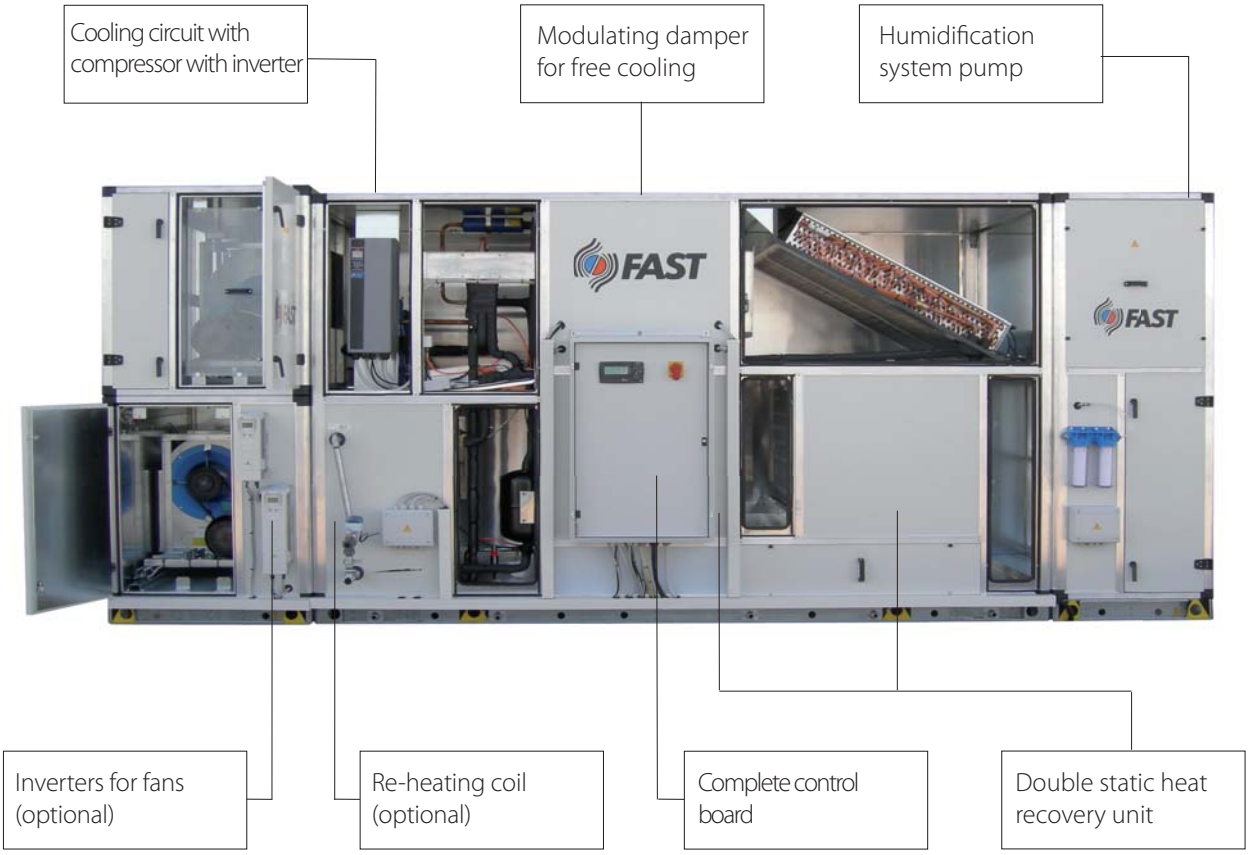
Humidifying systems with atomized water in the supply air flow.

Internal bottom panels equipped with draining panels with central discharge siphon, to better ensure the continuous discharge of water and avoid its stagnation inside the unit.

Complete control board installed on-board the unit. Remote panel for the control of all the main functions and visualization of the alarms.

Microprocessor control cabinet and control, capable of managing the different operating modes (all fresh air unit, air-only unit), granting the maximum energy saving in each operating condition. Standard RS485 interface (MOBUS protocol) for connection with a remote supervision system. Manual season change (summer/winter).

Upon request: water reheating coil (only Std and Eco), enthalpic free cooling (available only with room temperature control), bag filters, plug-fans with integrated rotation speed control.



Version	Adiabatic cooling / humidification	Recirculation damper	Hot gas re-heating coil	Water re-heating coil
EtaMax Std	●	-	-	o
EtaMax Dry	●	-	●	-
EtaMax Eco	●	●	-	●

● Standard, o Optional, - Not available

>Dimensions and weights

Model		040	060	100	160	250
Height	mm	1.810	1.970	2.405	2.770	2.770
Width	mm	1.215	1.375	1.695	2.015	2.335
Length	mm	4.830	5.150	5.722	6.685	7.005
Weight of Std version	kg	1.400	1.800	2.300	2.900	3.500

Dimensions and weights refer to the versions with standard fans.

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