AlfaMini

Air handling unit with high energy efficiency for wellness areas.
Air flow rates from 4.000 to 13.000 m3/h

ECOLOGICAL R410A REFRIGERANT

The AlfaMini units represent the ideal solution to grant comfort conditions in small-medium dimensions for wellness areas, spa, fitness centres, small swimming pools, sports centres, etc.
The unit combines a cooling circuit and a heat recovery system for the sensible and latent heat, specifically optimised to reduce at short terms the energy consumptions.
The main function of the unit, which is supplied as a **"plug & play"** machine, ready to use, is to dehumidify and at the same time grant the wellness conditions of the served ambience.
It is equipped with an efficient heat exchange system on the water side, which is necessary to partially heat the swimming pool water without additional costs.
The frame and all internal components are designed to guarantee the maximum resistance to corrosion.

>Version

5 available sizes
Bearing structure with frame from anodized aluminium.
Sandwich panels with 50 mm thick.
Cross flow heat recovery unit and cooling circuit.
Hot water coil with standard 3-way valve.
"Plug fan" fans
Plug and play: the unit is equipped with electric panel, regulation and cooling circuit.

Fast S.p.a. remains at disposal for any information or specific requests.

high efficiency

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>Main technical data

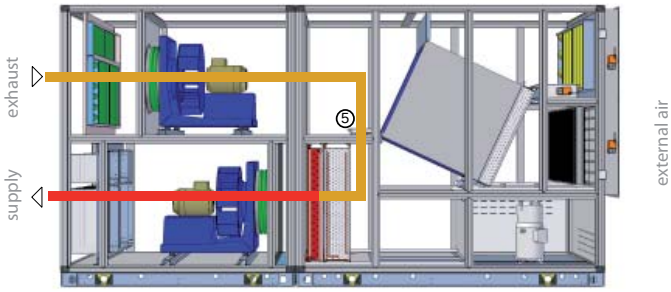
AlfaMini		025	040	060	100	130
Nominal air flow (supply/exhaust)	m^3/h	2.500	4.000	6.300	10.000	13.000
Static available pressure (supply/exhaust)	Pa	400	400	400	400	400
Recovered power heat recovery unit[1]	kW	7,9	12,6	20,4	32,0	41,5
Max. efficiency heat recovery unit[1]	%	80,8	79,3	80,1	79,5	79,4
Recovered power cooling circuit[1]	kW	7,5	10,5	21,3	31,7	45,7
Total recovered power[1]	kW	15,4	23,1	41,6	63,7	87,3
Compressors absorbed power[1]	kW	1,3	1,6	3,7	6,0	8,4
COP[1]	-	11,8	14,4	11,2	10,6	10,4
COP[2] (EN 14511)	-	3,9	4,0	4,1	4,0	4,1
Total dehumidification capacity[1]	kg/h	15,5	25,2	40,1	63,7	82,7
Fans absorbed power on supply	kW	1,6	2,6	3,7	5,9	7,6
Fans absorbed power on exhaust	kW	1,2	1,9	2,7	4,5	5,7
Type / Compressors no	n°	Scroll / 1				
Water reheating coil (standard)						
Power (without operating recovery unit)[1]	kW	26,1	35,4	61,6	95,3	124,5
Water flow [3]	l/h	2.250	3.050	5.300	8.200	10.700
Pressure drop on water side [3]	kPa	34,7	61	37	56,3	48
Plate heat exchanger R410A/ non aggressive water (standard)						
Nominal air flow [4]	l/h	950	1.120	2.500	3.600	5.400
Pressure drop [4]	kPa	19	19	31	32	33
Accessible plate heat exchanger with not aggressive water / swimming pool water (standard)						
Nominal water flow swimming pool[5]	l/h	1.200	1.400	3.100	4.500	6.800
Pressure drop on swimming pool side[5]	kPa	32,4	34	31,4	33	34,5
Pressure drop on intermediate circuit side[5]	kPa	21,2	22,3	20,6	21,6	22,5
Electrical data						
Power supply		400 V - 3 ph - 50 Hz				
Total fans absorbed current on supply	A	3,5	6,2	11	14,6	15
Total fans absorbed current on exhaust	A	2,6	4,9	6,4	11,3	11,3
Total absorbed current of unit	A	11,6	17,1	32,4	49,3	61,3
Starting current of unit	A	32,1	46,1	91,4	181,9	184,3

1 External air 0°C, RH 80%; internal air 29°C, RH 60%.
2 Data referring to the EN 14511 norm for unit with reheating only function
3 Inlet/ outlet water temperature 70/60°C; pressure drop on water side including the 3-way valve
4 Inlet/ outlet not aggressive water temperature 27/37°C
5 Inlet/ outlet water temperature of intermediate circuit 37/27°C; inlet/ outlet swimming pool water temperature 25/33°C
Technical data subject to change.

>Operating schemes - AlfaMini

Here under are the schemes of the main operating modes of the unit.
In all of the following schemes please consider that the hot water coil is always operating, as it must be referred to external air temperatures lower than 10°C with required supply temperature which has to balance the heat loss of the building.

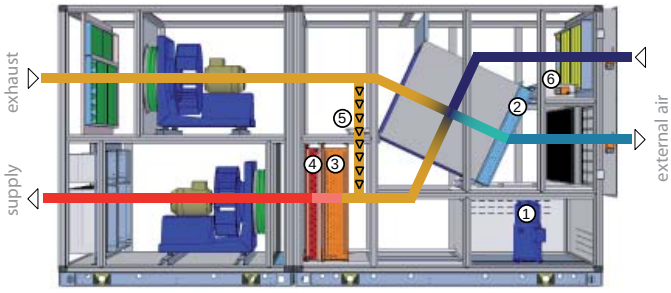
Cycle "operating"



This operating mode aims at reducing to zero the external air capacity.
The total air capacity is recirculated through the 5 damper and re-introduced in the swimming pool.
The water reheating coil is working.
The "operating" cycle is activated for the necessary time to reheat the room

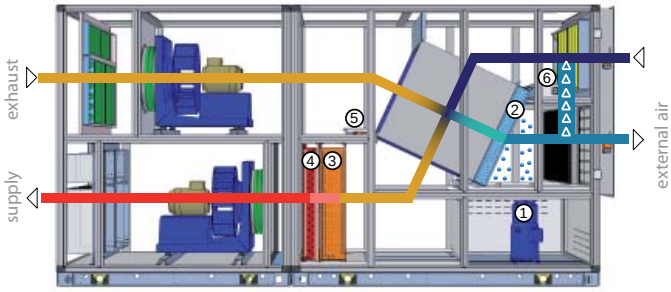
Cycle "dehumidifying"

With outdoor air dehumidification



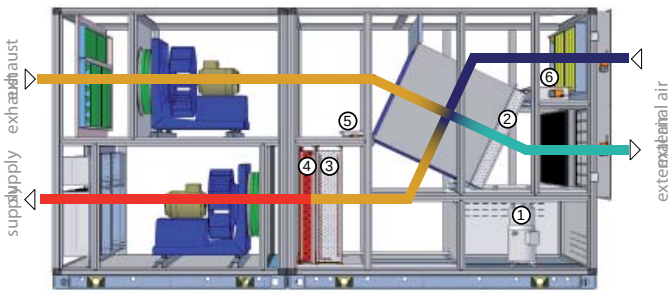
This operating mode aims at dehumidifying the ambience air with the external air, by balancing the drain evaporation.
The cooling circuit (composed of compressor n.1 and coils n. 2 and 3) allows to recover the sensible and latent heat of the exhaust air, and transfer it to the inlet air or water by means of the heat exchange system composed of the double exchanger on the water side.
The hot water coil n. 4 integrates, if necessary, the heating capacity supplied by the cooling circuit, housed on the inlet air flow (condensing coil n.3).

Dehumidification with outside air and alpha cycle



If it becomes convenient, the compressor also contributes to the swimming pool dehumidifying.
The fresh air flow rate is modulated by the fans inverters to reach the required wellness conditions.
According to the external ambience temperature the unit adjusts the operation in order to reach the best energy savings

Dehumidification with outside air (night sky)



During the night operation the unit adjusts the function settings to adapt to the evaporating variations of the pool and reduce the consumptions at minimum.

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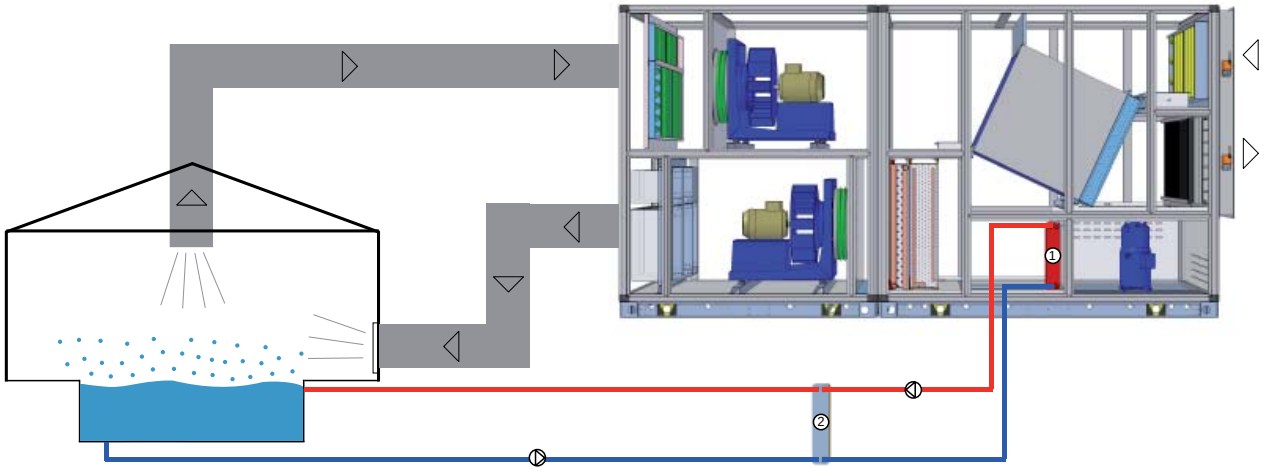
Cycle with heat transfer to water

If the air temperature conditions in the ambience are satisfied, the heat so produced by the cooling circuit will be sent to the swimming pool water, thanks to a double plate exchanger (standard).
A plate exchanger is an essential part of the cooling circuit of the unit (exchanger R410A/water of intermediate circuit, in the following figure indicated with n. 1). A further inspectionable exchanger (operating with recirculation water of the intermediate circuit/ swimming pool water, in the following figure indicated with n. 2) is supplied together with the unit. The heat system thus constituted is of very easy maintenance.
The components and the connections among the exchangers are responsibility of the client.



The schedule is indicative. For simplicity, not been given all the components needed to complete the water circuit

> Main components

Frame and components resistant to corrosion	●
Cooling circuit with scroll compressor and refrigerant R410A	●
Cross flow plate heat recovery unit	●
Plug fan with inverter	●
Electric motors with efficiency class EFF1	●
Water coil with 3-way valve and actuator	●
G4 Panel filter + F9 bag filters on the supply	●
Electric panel with controller and remote panel	●
RS485 Serial interface card (MOD-BUS protocol)	●
Plate heat exchanger on the cooling circuit	●
Plate heat exchanger with inspection possibility for swimming pool water	●
Refrigerant heat exchanger /swimming pool water (in alternative to the previous ones)	o

● Standard, o Optional, - Not available

>Characteristics

Bearing frame in anodized aluminium profiles with nylon reinforced corner pieces. The casing is made of sandwich panels (50mm thick), with internal surface in pre-painted galvanized steel, external surface in pre-painted galvanized steel and insulating material in hot injected polyurethane with density 42 kg/m^3, fixed without screws but with panel blocking profiles, doors with self-closing handles.
This fixing system permits uniform pressure over the casing, providing excellent air and water tightness (class B – EN 1886). The bearing elements and the components closings and are completely painted to guarantee the maximum resistance to corrosion. The inferior surface of the unit is equipped with draining panels in pre-painted galvanized steel with central discharge, sideways conveyed.

Cooling circuit equipped with scroll compressor equipped with rubber anti-vibration dampers, exchange coils refrigerant gas/ air with copper pipes and painted aluminium fins and frame, filtration devices, electronic expansion valve, liquid receiver, drier filter, control (pressure transducers and lights) and protection (high and low pressure switch), connections in brazed copper, ecologic refrigerant R410A.
The cooling circuit is inserted in a compartment isolated from the air flow to facilitate the control and maintenance operations.

Static cross flow heat recovery section with high efficiency in pre-painted aluminium. Dampers section: recirculation dampers used for the quick temperature set of the room, recirculation damper for the "alfa" cycle, damper on the external air intake and exhaust. All dampers are made of anodized aluminium and are individually controlled by an external actuator for a fine regulation of the air flow.

Fan sections epoxy painted resistant to corrosion, equipped with "plug fan" fans with wheels with high performance backward-curved blades.
Electric motors with efficiency class EFF1 directly coupled to the wheel, ideal to be controlled by the inverter (standard).

Filter section: spanel filters in the exhaust air flow (efficiency class G4 in compliance with EN779) and panel + bag filters in the supply (efficiency class G4 + F9 in compliance with EN779) which allow to respect the norms currently in force referring to the air quality of ambiences. A differential flow switch for the clogging filters is supplied as standard.

Water reheating coil with copper pipes and painted aluminium fins and frame with air reheating function on supply after dehumidifying, controlled by a modulating 3-way valve (standard); this device allows to finely regulate the air temperature on supply. The coil frame is made of painted galvanized aluminium, in order to guarantee the maximum resistance to corrosion.

Complete control board installed inside the machine. Electrical installation for the connections of power and signal, placed in pipe with cable-fixing clamp or rubber sleeve accessories, protection class IP44.
Standard remote panel for the control of the main functions and visualization of the alarms.

Microprocessor control board and cabinet capable of managing the different operating modes, granting the maximum energy saving in each operating condition. Standard RS485 interface card (MODBUS protocol) for connection with a remote supervision system.

Heat exchange system to reheat the swimming pool water composed by a double plate condenser.
One of the exchangers is inserted in the cooling circuit of the unit and mounted inside the machine: the heat exchange must take place between refrigerant and not aggressive water. The second one is for the swimming pool water, with possibility of inspection, in stainless steel AISI 316L and is supplied (alongside) not mounted.
The hydraulic circuit for the connection between the two plate exchangers must necessarily be completed with the indispensable components (pump, water filter, expansion valve, valves, etc.)

Upon request:
Refrigerant heat exchanger/ swimming pool water (in alternative to the precedent system).

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> Dimensions and weights

AlfaMini		025	040	060	100	130
Height	mm	1.765	1.765	2.245	2.405	2.405
Width	mm	895	895	1.055	1.375	1.695
Length	mm	3.230	3.390	4.190	4.510	4.670
Weight	kg	900	1.000	1.350	2.060	2.600

Le dimensioni ed i pesi sono suscettibili di modifiche.