AIROSTAR Heat Recovery

Air Handling Unit

39SQ/SQP/SQR

€CO EFFICIENCY

PLUG & PLAY FRESH AIR HANDLING UNIT

Carrier

United Technologies

FRESH AIR

ESSENTIAL FOR PERFECT COMFORT

Human beings can live without food for several weeks, without water for several days, but only up to four minutes without air. We use on average 18000 litres air per day, and it is obvious that fresh air is vital.

Construction products, furniture, decorating and maintenance products, as well as human activity and office automation products generate chemical, biological and particle pollutants that may be the cause of allergies and respiratory diseases. Recent studies have also shown that increased CO_2 concentration in the air of a confined space reduces attention and productivity. It is clear that air renewal in buildings is necessary and indispensable for the well being and the performance of the occupants.

ENERGY-EFFICIENT BUILDINGS

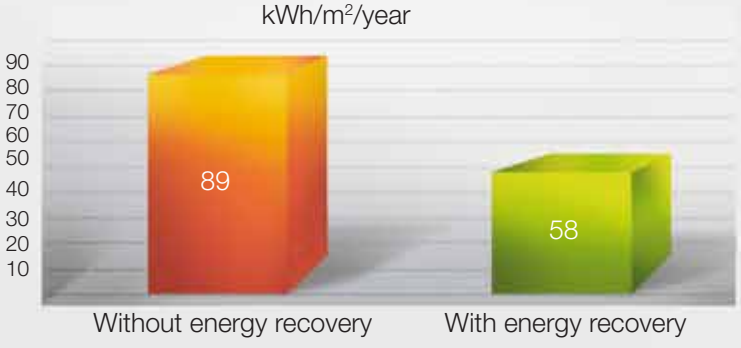
A GLOBAL CONCEPT

The energy consumption in buildings represents 40% of the total energy consumption in Europe. If we want to save our planet, we need to change our habits and design more energy-efficient buildings.

European regulations have a clear objective:
they demand a significant reduction in building energy consumption with the aim of reducing the CO_2 emissions to the atmosphere by 20% by 2020

A real challenge for the building sector.
This objective can only be achieved if we work on all building elements: location, leak tightness, thermal insulation, lighting, heating, air conditioning and ventilation systems etc. Many ventilation systems introduce cool air into the building in winter and reject warm air to the outside, wasting valuable energy.

Simulation performed for an office building (1380 m²) with Carrier's HAP software



ENERGY SAVINGS AT ALL LEVELS

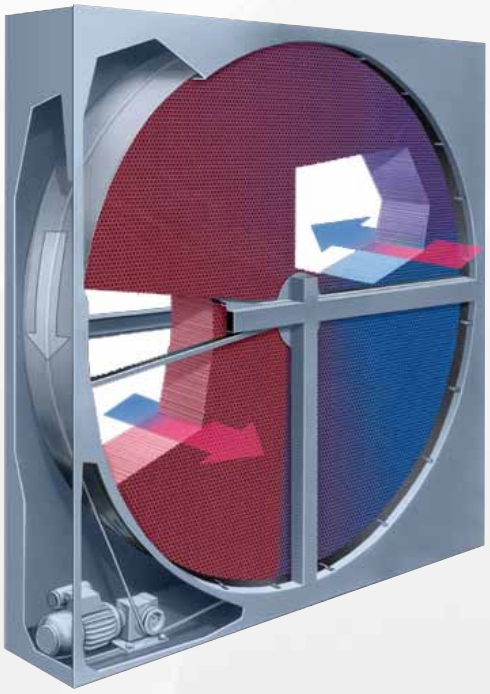
EXHAUST AIR

... IS NO LONGER WASTED

Why not use the exhaust air to pre-heat fresh air?

The AiroStar uses a variable-speed rotary heat exchanger to recover up to 90% of the heat from the exhaust air and transfer it to the fresh air supplied to the building.
The AiroStar is also available with standard and high efficiency (Ecodesign compliance) cross-flow plate heat exchangers. In winter the cold outside air is pre-heated and in summer the warm outside air is pre-cooled free-of-charge.

The heat exchangers are carefully selected to offer maximum thermal performance while minimising fan consumption.



During the night, outside the heating periods, when the outside temperature permits natural cooling of the building (free cooling), the energy recovery heat exchanger is deactivated and the fans operate at maximum air flow to pre-cool the building and limit the cooling requirements during the day.

FRESH AIR ON DEMAND

The energy-saving first step is to stop unnecessary air renewal in the building and to supply the correct required quantity of fresh air.

The AiroStar is equipped with high-efficiency direct-drive plug fans. Removing belt-pulley drives enhances system efficiency and reduces the frequency of maintenance operations.
Variable-speed fans that are independently controlled by frequency Inverters allow the AiroStar to adjust the fresh air quantity, based on space occupancy and CO_2 concentration in the room.

INVERTER Technology

TWO CONTROL MODES

OPTIMISE ENERGY SAVINGS

CONSTANT PRESSURE CONTROL IN THE SUPPLY AIR DUCT

This mode allows the use of air terminal units with a fresh air damper, controlled by an air quality sensor. If an office is unoccupied, the fresh air damper closes, and the fresh air supply from the air handling unit is reduced.

DEMAND VENTILATION

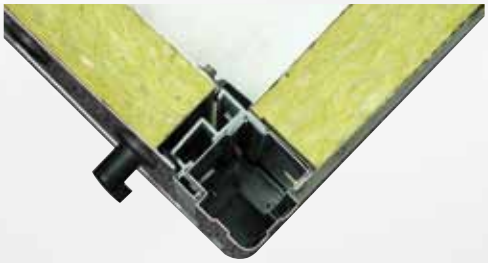
The fresh air flow is controlled by an air quality sensor installed in a strategic location, e.g. a meeting room or restaurant.
The fresh air quantity in the room is proportional to the occupancy. If there are more occupants, more fresh air is supplied.

MAXIMISED ENERGY SAVINGS FOR GREATER EFFICIENCY

AIR QUALITY THAT IMPROVES ON NATURE

The 39SQ AiroStar is equipped with high-performance F7 air filters. The filter doors include a cam lever to avoid bypass leakage.
To facilitate maintenance the filters are installed on slides, and a pollution detection device signals the need for filter replacement. Extract air and fresh air use the same filter type to simplify management of consumables.
The smooth interior surfaces and the closed frame profile facilitate cleaning.

NOTHING ESCAPES



The fully closed frame profile and 60 mm thick double-skin panels ensure thermal insulation with an exceptional thermal bridging value.
Large hinged doors or removable panels, equipped with peripheral joints, ensure perfect air tightness.
The unit casing meets the requirements of thermal transmission class T2 and leakage class L2 in accordance with standard EN 1886.

EARSIER TO USE

Pro-Dialog AHU control combines superior intelligence with simplicity of use. It controls the operation of all components and optimises power consumption. Temperature control, based on return, supply or room air, adjusted for outside temperature, history of possible incidents, immediate air flow measurement etc. with Pro-Dialog everything is possible!

The integrated web server gives access to the operating parameters from any standard internet browser. This user-friendly approach permits simple equipment control - the user is guided at every step. The information is displayed in the language chosen by the user. The Pro-Dialog+ user interface, available as an option can be installed up to 300 metres from the unit, and a single interface allows remote control of several air handling units.

MORE CHOICE

Carrier offers a wide range of chilled-water/hot-water terminal units and air diffusers to distribute fresh air in the occupied space :
linear Moduboot diffusers,
four-way cassettes,
chilled beams with or without lighting,
medium or high-pressure ducted fan coil units,
if required equipped with a fresh air damper controlled by an air quality sensor for additional energy savings.

EARSIER TO INSTALL

The air handling unit is delivered in one piece, complete with reheating and cooling coils, dampers etc. - all components are installed at the factory.

But the unit can easily be separated into two sections for installation in locations with difficult access.The control box and control are installed and tested at the factory, and the air handling unit is ready to operate. Commissioning is quick and trouble-free.
A plug & play concept.

THE ECO SYSTEM

The AiroStar fresh air handling unit has been designed for easy integration into the AQUASMART system.
This means, operation of the AiroStar is controlled consistently together with all other system components. Harmonised control for maximum comfort and minimised energy cost.

model 39 SQ		0402	0404	0604	0606	0806	0808	1008	1010	1210
Maximum air flow*	m³/h	3.050	5.330	8.560	13.460	18.500	25.200	32.200	40.800	58.300
	m³/s	0,85	1,48	2,38	3,74	5,14	7,00	8,94	11,33	16,19
Minimum air flow**	m³/h	737	1.350	2.320	3.510	4.950	6.700	8.700	10.800	13.500
	m³/s	0,20	0,38	0,64	0,98	1,38	1,86	2,42	3,00	3,75
Capacity control	Variable speed drive (option)									
Exhaust and supply fans	Plug fan or belt driven centrifigual fans (option)									
Exhaust and supply air filters	Bag filter, F7 efficiency									
Outside air pre-heating coil	Hot water coil or electrical heater (option)									
Supply air re-heating coil	Hot water coil or electrical heater (option)									
Supply air cooling coil	Chilled water coil or DX coil (option)									

model 39 SQ		P0405	P0506	P0606	P0707	P0808	P0909	P1010
Maximum air flow*	m³/h	3.050	4.960	6.100	8.700	11.800	15.300	19.300
	m³/s	0,85	1,38	1,69	2,42	3,28	4,25	5,36
Minimum air flow**	m³/h	737	1.225	1.549	2.247	3.265	4.501	5.328
	m³/s	0,20	0,34	0,43	0,62	0,91	1,25	1,48
Unit thermal efficiency***	%	60,7	62,8	62,9	63,9	63,1	62,5	62,0
Heat reclaim heat exchanger	Plate heat exchanger							
Capacity control	Variable speed drive							
Exhaust and supply fans	Plug fan with frequecy inverter							
Exhaust and supply air filters	Pleated filter, F7 efficiency							
Outside air pre-heating coil	Hot water coil or electrical heater (option)							
Supply air re-heating coil	Hot water coil or electrical heater (option)							
Supply air cooling coil	Chilled water coil or DX coil (option)							

model 39 SQ		R0606	R0707	R0808	R0909	R1010	R1111	R1212	R1412	R1416
Maximum air flow*	m³/h	6.100	8.700	11.800	15.300	19.300	23.700	28.600	33.700	46.000
	m³/s	1,69	2,42	3,28	4,25	5,36	6,58	7,94	9,36	12,78
Minimum air flow**	m³/h	1.549	2.247	3.265	4.501	5.328	6.882	7.847	9.150	12.750
	m³/s	0,43	0,62	0,91	1,25	1,48	1,91	2,18	2,54	3,54
Unit thermal efficiency***	%	77,9	78,5	78,3	78,1	77,9	78	78,2	76,3	76,3
Heat reclaim heat exchanger	Rotary									
Capacity control	Variable speed drive									
Exhaust and supply fans	Plug fan with frequecy inverter									
Exhaust and supply air filters	Bag filter, F7 efficiency									
Outside air pre-heating coil	Hot water coil or electrical heater (option)									
Supply air re-heating coil	Hot water coil or electrical heater (option)									
Supply air cooling coil	Chilled water coil or DX coil (option)									

* Max airflows are calculated according to 5 m/s heating coil face velocity
** Min air flows are calculated according to 1,5 m/s DX coil face velocity
*** Thermal efficiency at 2 m/s header box coil velocity, outside -10 °C, extract air 22 °C/50 %

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