

HHFlex

Modular solution for air handling



HHFlex

Undeniable facts!

HHFlex air handling units have a modular platform. This makes it possible to configure them in a completely customer and project-specific manner on the basis of the air flow required. The starting point is the application of high quality components in the form of heat recovery systems, humidifiers, filters, heat exchangers for cooling and heating, sound attenuators and, of course, various types of fans and drives.

The HHFlex is characterised by quality, a long life span, low maintenance costs and low energy costs – specific aspects to which Systemair attaches a great deal of value. User-friendliness was also an important element in the design of the HHFlex. Examples of this are the inspection options provided by large access doors and filters that are extremely easy to install.

The multitude of configuration options allows HHFlex air handling units to be custom-made for every application. The possibilities are virtually endless.

It is also possible to widen your horizons in relation to the application of HHFlex air handling units. HHFlex is not only a reliable choice for Non-residential buildings and Health facilities, the high expectations in relation to corrosion resistance and the stringent requirements of Atex explosion-proofing in the Marine and Offshore market are also met.

Systemair also holds the Hygiene certificate in order to meet the stringent requirements that apply in hospitals and the pharmaceuticals industry.

HHFlex is a real all-rounder!

Systemair: HHFlex - indoor installation

- 68 unit sizes of 1,000 m³/h to 125,000 m³/h and more.
- Free choice of configuration.
- High quality components, durable finish and low power consumption.
- Hygiene and Eurovent certified.
- EN1886: D1 / L2 (L1) / F9 / T2 / TB2



Systemair: HHFlex - outdoor installation

- Supply and exhaust units separate, stacked, parallel, in-line or side by side.
- High quality weather-resistant finish.
- Inspection/service space for installation of accessories.
- Various choices of duct connections.





Reference Systemair: Isala Hospital - Zwolle, Netherlands

Systemair supplied a total of 48 air handling units for the construction of Isala Hospital in Zwolle. No fewer than 21 of these air handling units were intended especially for operating theatres that are all located in building Vlinder 3 of this hospital, which was the largest non-academic hospital in the Netherlands at the time of its construction.

Systemair harmonised and adjusted the technology in the air handling units in accordance with the principal's wishes before and during the delivery. When the requirements were changed again after the installations had been taken into use, the air handling units were adjusted in such a way that they met these requirements.

Copyright: Isala

Functions

All of the functions of the HHFlex in an overview

The HHFlex is a unique design, which offers infinite configurations and air handling unit compositions. The Eurovent Certified air handling units therefore offer a tailor-made solution on every customer demand. The wide range of fans, heat recovery applications and heat exchangers offer high end economic solutions.

Here are some features of the HHFlex:

- 68 basic sizes
- Large number of possible combinations
- Certified selection software
- High quality coated and galvanized steel
- Stainless steel
- Proven durability
- Certified and low noise levels
- Heat recovery in three basic types
- Optimum energy efficiency possible
- Possibility to integrate special components

Casing

Systemair air handling units consist of a steel profile construction developed in-house that includes double-skinned panels and doors.

The 1 mm thick galvanised and coated steel tube profiles produce a frame that is both rigid and light. The profiles are connected with ABS corner pieces for extreme leak-tightness and a stable construction. The inner and outer skin of the 60 mm thick panels are produced from galvanized sheet and stainless steel optional for panels and frames, inside and outside available. The panels can have an extra anti-corrosion treatment, and the high quality thermal insulation limits heat loss and gives the flooring a high rigidity for easy access. The panels are fastened from the outside for easy maintenance.

Assembly is simple and the result is a unit with smooth interior surfaces, suitable for hygienic applications. The high quality polymer coating (standard RAL 7035) on the exterior and/or interior means that the entire casing is extremely effectively protected against corrosion and UV radiation. It is also possible to choose a stainless steel or a sound insulating casing for the unit with an inertia mass wall construction for outstanding acoustical properties. Flat-packed delivery is also possible with an easy assembly on site.

Filters

All filter types are possible for the HHFlex:

- panel filters
- bag filters
- pleated filters
- electrostatic filters
- chemical filters
- carbon filters
- HEPA filters

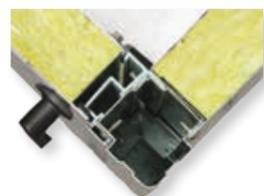
Slide-in filters can be removed from the outside with a single action. Build-in filters are accessible through an inspection space in the air handling unit. The HEPA filter is easy to install due to its fully welded heavy gauge construction, which allows the filter boxes to be positioned on a rigid support frame and to be able to seal according HEPA filter standards. It is possible to select carbon filters for filtering of aromatic substances. The HHFlex can be provided with maximum absorbant exposure for the highest capture efficiency.

Dampers

The class 3 dampers are produced from aluminium or galvanised steel. The dampers can be configured for all situations. All dampers are suitable for actuator installation as standard. It is possible to apply an extra, acid-resistant, coating.

Plug fans

The direct driven Systemair plug fans support EC-technology. This technology enables the HHFlex to achieve optimum energy output and low operating costs. The plug fans are also extremely suitable for situations where V-belts are not permitted (VDI 6022). Plug fans can also be used for high capacities with the aid of traditional AC-motors, with efficiency classification IE2, IE3 or IE4.



Casing



Bag filter



Plug fan with PM-technology



Plug fan with EC-technology



Damper

All functions of the HHFlex in an overview

Fans

Systemair has a wide range of indirectly driven fans. The V-belt drive has a simple, single-point tensioning device. The wide range can be divided into fans and motors that are available in 1 or 2 speeds or suitable for frequency inverter.

The motors used comply with the most recent ErP-directive motor fan combination and comply with IEC standard efficiency classes IE2, IE3 or IE4. There are various configurations possible for fans and motors. In addition, the entire set-up is provided with steel spring anti vibration mounts and is maintenance friendly.

Heat recovery wheels

Systemair has three types of heat wheels in its range, namely condensation, hygroscopic and sorption rotors. All three supply an efficient form of energy recovery. The casing of the heat wheel fits tightly onto the casing of the

air handling unit and is corrosion-resistant. There are also various possible build-in constructions. The required humidification capacity and mechanical cooling can be reduced (up to 80%) if the sorption rotor is used. The section in which the heat recovery is located can be fitted with simple inspection spaces. This results in maintenance-friendly air handling units.

Plate exchangers

In air handling units where separate air flows are required, it may be necessary to use a plate heat exchanger. Plate heat exchangers can be delivered with a standard or high level of efficiency. There are two versions of the plate heat exchanger. The heat recovery is controlled by a built-in face and bypass damper. The bottom of air handling units with plate exchangers is fitted with stainless steel draintrays on both the inlet and outlet side as standard.

Run around coil system

The run around coil system is a system in which a mixture of water and glycol circulates between two elements. Run around coil systems are used when it is necessary to completely separate two air flows. Using the run around coil system makes the air handling unit ideally suited for situations in which hygiene is the design parameter. In addition, this system is extremely flexible and therefore easy to use in various situations.

Heating coils

The most common types of heaters are hot water, electrical and steam heaters. The heater with hot water can be placed in any air handling unit. The casing is produced from galvanized or stainless steel and the heat exchangers are available in Cu/Al, Cu/AlPP, Cu/Cu, FeZn and stainless steel. The batteries are economically selected, specifically for the situation with the primary goal to keep energy costs low.

The heater can be fitted with a frost protection thermostat. This protects every circuit individually against freezing, which is ideal in combination with low temperature systems. The electric heater is completely integrated into the unit and can be positioned in accordance with the factory standards. This heater also has a wide range of capacities and switching options. Electric heaters are fitted with a safety screen and an overheat and fire thermostat.

Cooling coils

The majority of coolers used are based on chilled water and direct expansion (DX). The DX cooler has connections that are easily accessible. The section with coolers can be expanded with plastic or galvanized droplet eliminators. The droplet eliminator is easy to remove, which makes the coil easy to clean and extremely maintenance and user-friendly. The unit is fitted with a stainless steel sloping condensation drain tray.



Indirectly driven fan



Electric heater



Heat wheel



Plate exchanger



Heater



Cooler

All functions of the HHFlex in an overview

The coil frame is produced from galvanized or stainless steel and the heat exchangers are available in Cu/Al, Cu/AIPP, Cu/Cu, FeZn and stainless steel.

Sound attenuators

The sound attenuators can be specifically designed and positioned for every air handling unit. The values are calculated in accordance with ISO 7235:2003. The sound attenuators are supplied as standard with an erosion-resistant top coating.

Humidifiers

In situations in which the indoor climate is additionally controlled on the basis of the moisture content of the ventilation air, the unit can be fitted with humidification. The isothermic steam humidification is highly standardized.

The patented venturi and vortex plate guarantee a short absorption process. Adiabatic humidification is preferred in terms of energy consumption. A hygienic version of the traditional spray and wet-cell humidifier is also available.

The infrasonic humidifier, whereby reverse osmosis water is atomised at high pressure, is the most optimum solution in all aspects. The special technology makes it possible to fit an almost maintenance free and hygienic humidifier to the air handling unit.



Electric steam generator



Infrasonic humidifier

Standardisation

Powerful performance and guaranteed quality

Systemair participates in platforms geared to develop and maintain European and international air handling standards. The air handling units produced by Systemair meet these standards. Both units deliver high level performance in the area of hygiene and sustainability qualifications. Two European standards have been formulated that describe the properties of the casing construction and performance of the unit, components and sections. These are the following standards:

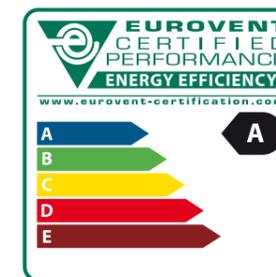
- **EN1886 "Air handling units - Mechanical performance"** - December 2007
- **EN13053 "Air handling units - Ratings and performance for units, components and sections"** - July 2011

The HHFlex series is Eurovent certified for its classifications and performance in accordance with the European standards EN1886 and EN13053. For maximum hygiene it is possible to produce the HHFlex completely in accordance with all standards that are applicable to a

hygienic solution. Certification of this hygiene application is carried out by an independent institute. This hygiene certification represents a qualified hygiene standard, whereby testing is related to all relevant European standards and guidelines. These guidelines define the specific requirements for a hygienic version of an air handling unit to the smallest detail.

The purpose of Eurovent certification is to reinforce customers' confidence. All mechanical features and performance are measured and checked regularly on the basis of extremely specific prescriptions, procedures and test regulations. Deviations from certain values are not tolerated.

This strict execution and inspection by the Eurovent Certification Institute guarantees the performance of a design and the reliability of the power consumption. These designs have Energy Labelling.



The performance of HHFlex is certified by Eurovent with the following classification in accordance with EN1886:

- Mechanical strength - D1
- Air leakage class - L2 (option L1)
- Filter bypass class - F9
- Thermal transmittance class - T2
- Thermal bridging factor - TB2

The Eurovent certified performance is related to the EN13053 with zero-tolerance in relation to the technical specifications provided.

Hygiene guidelines and standards:

VDI-6022, EN13779, VDI-3808-DIN, 1946-4, Ohnorm H-6021, SWKI 99-3, VA-SWKI 104-01, Ohnorm H-6020.

Dimensions and weights

Several configurations and unit types

The HHFlex is known for its virtually infinite options. A suitable solution can be devised for any situation. As the unit has so many options it is impossible to include everything in a single overview. The tables on the next page give an impression of the strength of the HHFlex.

These tables display a number of air handling units and their specifications. *Table 5* shows nine models of an air handling unit with a heat wheel. *Table 6* shows five models of the countercurrent plate exchanger, and *table 7* shows ten models of an air handling unit with recirculation. *Table 8* shows ten models of a supply unit and *table 9* shows ten models of a run around coil exhaust unit. Finally, *table 10* shows ten models of a run around coil supply unit.

All tables show four variants of the unit: the height, width and depth measurements and the weight of the unit. Our air handling units can be fitted with features

including infrasonic humidification, steam humidification, de-humidification, reversible water or DX heaters and coolers and sound attenuators. There are also carbon, absolute, chemical and electrostatic filters. Finally, our HHFlex air handling units can be fitted with integrated controls (plug & play).

Naturally, you are completely free to contact us if you would like more information about a custom-made solution and the possibilities of the HHFlex.

 Reference Systemair: Rabobank head office - Utrecht, Netherlands

The Rabobank Administration Centre was taken into use in 2011. The building is 105 metres high, which makes it the highest office building in Utrecht. Systemair supplied eight air handling units that supply a total of 335,000 m³/h of air for this building, otherwise known as 'The Binoculars'.

Sorption heat wheels are used to save energy. Besides heating, this application also produces savings in relation to the humidification and cooling of ventilation air.



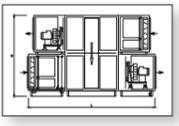
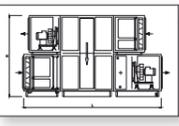
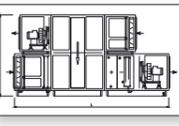
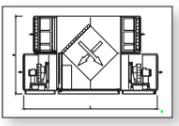
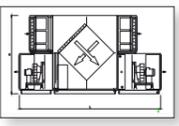
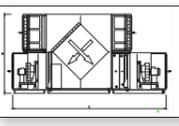
HEAT WHEEL UNIT	UNIT TYPES									
	R06.02	R08.04	R12.06	R16.08	R20.10	R24.12	R24.14	R24.16	R24.18	
 WITHOUT COILS	Height	1,218	1,698	2,338	2,978	3,618	4,258	4,898	5,538	6,178
	Width	1,058	1,378	2,018	2,658	3,298	3,938	4,013	4,653	4,973
	Length	3,494	3,494	3,494	3,654	3,974	4,294	4,614	4,774	5,094
	Weight	785	1,060	1,690	2,415	3,755	4,875	5,680	7,480	8,455
 WITH HEATING COIL	Height	1,218	1,698	2,338	2,978	3,618	4,258	4,898	5,538	6,178
	Width	1,058	1,378	2,018	2,658	3,298	3,938	4,013	4,653	4,973
	Length	3,814	3,974	3,974	4,294	4,614	5,094	5,512	5,734	5,894
	Weight	820	1,120	1,785	2,590	3,985	5,200	6,155	7,965	8,885
 WITH HEATING AND COOLING COIL	Height	1,218	1,698	2,338	2,978	3,618	4,258	4,898	5,538	6,178
	Width	1,058	1,378	2,018	2,658	3,298	3,938	4,013	4,653	4,973
	Length	4,294	4,454	4,454	4,774	5,094	5,672	5,992	6,472	6,632
	Weight	875	1,205	2,340	2,830	4,270	5,755	6,600	8,590	9,640

Table 5: Types of heat wheel unit - Dimensions and weights of the same types as the 'Selection Tables' section.

COUNTERCURRENT PLATE EXCHANGERS UNIT	UNIT TYPES					
	P06.02	P08.04	P12.06	P16.08	P20.10	
 WITHOUT COILS	Height	1,218	1,698	2,338	2,978	3,618
	Width	1,058	1,378	2,018	2,658	3,298
	Length	3,654	4,454	5,094	5,094	6,054
	Weight	740	1,155	1,960	2,730	4,310
 WITH HEATING COIL	Height	1,218	1,698	2,338	2,978	3,618
	Width	1,058	1,378	2,018	2,658	3,298
	Length	4,134	4,934	5,574	5,414	6,374
	Weight	785	1,220	2,070	2,830	4,460
 WITH HEATING AND COOLING COIL	Height	1,218	1,698	2,338	2,978	3,618
	Width	1,058	1,378	2,018	2,658	3,298
	Length	4,614	5,414	6,054	5,894	7,014
	Weight	850	1,305	2,210	3,070	4,960

Additional information for table 5 to 10:

- Dimensions expressed in mm.
- Weight expressed in kg.
- Extra length for pre-heating battery: 160 mm.
- Extra length for inspection space: 480 mm.
- Dimensions include the height of the support frame 160 mm. 62 mm is sufficient in the majority of cases.
- Selections based on standard conditions.

Table 6: Types of countercurrent plate exchanger unit - dimensions and weights of the same types as the 'Selection Tables' section.

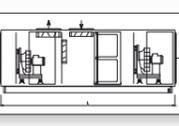
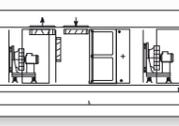
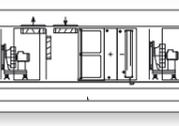
RECIRCULATION UNIT	UNIT TYPES									
	04.02	04.04	06.06	08.08	10.10	12.12	14.14	16.16	20.16	24.18
 WITHOUT COILS	Height	658	898	1,218	1,538	1,858	2,178	2,498	2,818	3,138
	Width	738	738	1,058	1,378	1,698	2,018	2,338	2,658	3,298
	Length	1,058	1,058	1,218	1,538	1,698	1,858	2,178	2,658	2,978
	Weight	150	150	230	530	1,218	725	945	1,475	2,010
 WITH HEATING COIL	Height	658	898	1,218	1,538	1,858	2,178	2,498	2,818	3,138
	Width	738	738	1,058	1,378	1,698	2,018	2,338	2,658	3,298
	Length	2,178	2,178	2,338	2,658	2,818	3,138	3,458	3,778	4,196
	Weight	235	255	370	570	760	1,090	1,500	1,925	2,580
 WITH HEATING AND COOLING COIL	Height	658	898	1,218	1,538	1,858	2,178	2,498	2,818	3,138
	Width	738	738	1,058	1,378	1,698	2,018	2,338	2,658	3,298
	Length	2,658	2,658	2,818	3,138	3,298	3,458	3,778	3,938	4,676
	Weight	285	310	460	700	935	1,290	1,660	2,185	3,035

Table 7: Types of recirculation unit - dimensions and weights of the same types as in the 'Selection Tables' section.



Reference Systemair: De Rotterdam – Rotterdam, Netherlands

The construction of De Rotterdam on the Wilhelminapier in Rotterdam was completed in 2013. This 150 metre high building has 44, 40 and 42 storeys and a total floor space of 162,000 m². The building provides space for offices, apartments and a hotel.

Systemair supplied 12 air handling units that can collectively heat, cool and humidify 530,000 m³ of air per hour. In order to save energy, all units (the largest moves 100,000 m³/h) are fitted with heat wheels. They reduce the costs of heating and humidifying the ‘most densely urbanised part of the Netherlands’ by more than 70%.

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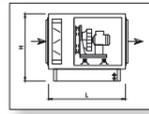
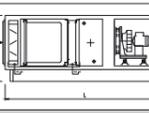
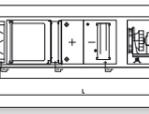
SUPPLY UNIT	UNIT TYPES									
	04.02	04.04	06.06	08.08	10.10	12.12	14.14	16.16	20.16	24.18
 <p>WITHOUT COILS</p>	Height	858	898	1,218	1,538	1,858	2,178	2,498	2,818	3,138
	Width	738	738	1,058	1,378	1,698	2,018	2,338	2,658	3,298
	Length	2,818	1,058	1,218	1,538	1,698	1,858	2,178	2,658	2,978
	Weight	150	150	230	360	530	725	945	1,475	2,010
 <p>WITH HEATING COIL</p>	Height	658	898	1,218	1,538	1,858	2,178	2,498	2,818	3,138
	Width	738	738	1,058	1,378	1,698	2,018	2,338	2,658	3,298
	Length	2,178	2,178	2,338	2,658	2,818	3,138	3,458	3,778	4,196
	Weight	235	255	370	570	760	1,090	1,500	1,925	2,580
 <p>WITH HEATING AND COOLING COIL</p>	Height	658	898	1,218	1,538	1,858	2,178	2,498	2,818	3,138
	Width	738	738	1,058	1,378	1,698	2,018	2,338	2,658	3,298
	Length	2,658	2,658	2,818	3,138	3,298	3,458	3,778	3,938	4,676
	Weight	285	310	460	700	935	1,290	1,660	2,185	3,035

Table 8: Types of supply unit - dimensions and weights of the same types as the 'Selection tables' section.

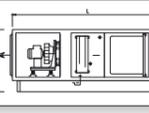
RUN AROUND COIL EXHAUST UNIT	UNIT TYPES									
	04.02	04.04	06.06	08.08	10.10	12.12	14.14	16.16	20.16	24.18
	Height	858	898	1,218	1,538	1,858	2,178	2,498	2,818	3,138
	Width	738	738	1,058	1,378	1,698	2,018	2,338	2,658	3,298
	Length	2,178	2,178	2,338	2,658	2,818	2,978	3,618	3,938	4,356
	Weight	245	270	410	625	860	1,195	1,760	2,260	2,965

Table 9: Types of run around coil exhaust unit - dimensions and weights of the same types as the 'Selection tables' section.

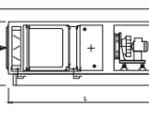
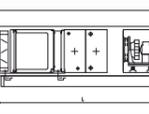
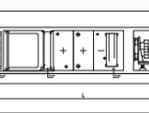
RUN AROUND COIL SUPPLY UNIT	UNIT TYPES									
	04.02	04.04	06.06	08.08	10.10	12.12	14.14	16.16	20.16	24.18
	Height	858	898	1,218	1,538	1,858	2,178	2,498	2,818	3,138
	Width	738	738	1,058	1,378	1,698	2,018	2,338	2,658	3,298
	Length	2,178	2,178	2,338	2,658	2,978	3,138	3,458	4,258	4,356
	Weight	230	255	390	605	860	1,210	1,590	2,600	2,905
 <p>WITH HEATING COIL</p>	Height	858	898	1,218	1,538	1,858	2,178	2,498	2,818	3,138
	Width	738	738	1,058	1,378	1,698	2,018	2,338	2,658	3,298
	Length	2,498	2,498	2,658	2,978	3,298	3,458	3,778	4,578	4,676
	Weight	255	290	440	675	955	1,330	1,745	2,790	3,170
 <p>WITH HEATING AND COOLING COIL</p>	Height	858	898	1,218	1,538	1,858	2,178	2,498	2,818	3,138
	Width	738	738	1,058	1,378	1,698	2,018	2,338	2,658	3,298
	Length	2,978	2,978	3,138	3,458	3,778	4,098	4,258	5,058	5,156
	Weight	305	345	540	810	1,130	1,625	2,025	3,160	3,590

Table 10: Types of run around coil supply unit - dimensions and weights of the same types as the 'Selection tables' section.

Systemair Worldwide



Quality: Systemair is certified in accordance with ISO 9001; ISO 14001, ATEX and European fire safety standard EN 12101-3. Our testing and development Laboratories are some of the most modern facilities in Europe. The measurements are executed in accordance with international standards, such as AMCA and ISO.

Save energy and reduce operating costs! You can find our "Green Ventilation" label on all products that are extremely energy efficient. All products with the Green Ventilation label combine economy with energy efficiency.



Skinnskatteberg, sweden:

The head office of the Systemair group is located in Skinnskatteberg, Sweden. The production is almost completely automated with the aid of modern machines with advanced computer support. Moreover, this is the location of the most advanced test installation of the concern for the circuit testing of technical specifications.

Klockgården, Sweden:

Production of small air handling cabinets takes place in Klockgården in Skinnskatteberg. This is also the location of the central warehouse of LSA Frico.

Windischbuch, Germany:

Production facility for ventilators and modular air handling cabinets, specialised in engineered products (e.g. tunnel and jet ventilators). Distribution centre.

Langenfeld, Germany:

Production of air curtains.

Mühlheim an der Ruhr, Germany:

Producer of air handling cabinets for swimming pools with a focus on ventilation comfort and high output.

Istanbul, Turkey:

Production of air handling units.

Hässleholm, Sweden:

VEAB is a leading producer in the field of electrical duct heating in Europe. Production of heating batteries and air heaters.

Ukmergė, Lithuania:

Production of smaller heat recovery units for houses.

Bratislava, Slovakia:

Besides air distribution products, the factory in Bratislava also produces EN certified fire and smoke dampers.

Maribor, Slovenia:

Specialised in radial combustion gas ventilators. EN certified.

Aarhus, Denmark:

Production of large air handling units.

Eidsvoll, Norway:

Production of air handling cabinets for the Norwegian market.

Bouctouche, Canada:

Bouctouche is the home of our largest production facility in North America for air handling cabinets and pipe ventilators for applications in offices and homes.

Madrid, Spain:

Production of air handling units for the southern European market.

Kuala Lumpur, Malaysia:

Production of products for the Asian market.

Hyderabad, India:

Production of air distribution products.

New Delhi, India:

The factories in New Delhi and Noida produce grates and diffusers. This is also the location of the head office of Systemair software.

Milan, Italy:

A wide range of coolers are developed and produced in our factory in Italy, Systemair AC.

Lenexa, USA:

Production of ventilators primarily for the North American market. Distribution centre.

Tillsonburg, Canada:

Producer of air handling cabinets for school classroom ventilation in the North American market.

Waalwijk, Netherlands:

Producer of air handling units.

