

Geniox

Quick guide





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The dimensions and data used in this leaflet are a guideline only.
Accurate calculations must be made in SystemairCAD.

Comfort ventilation by Systemair

Comfort ventilation describes the ventilation systems most often used in hospitals, hotels, schools, offices or in your own home. The purpose of this ventilation system is to create a healthy and comfortable indoor climate. To achieve this purpose, Systemair offers two types of air handling units for comfort ventilation, Geniox Comfort and Geniox GO.

Geniox Comfort offers the opportunity to adapt the air handling unit completely to your project. The unit is designed in flexible modules. This gives you the freedom to choose precisely the features that you need.

Geniox GO is a pre-configured, compact air handling unit. This means that we have prepared a standard solution for you to make it quicker and easier for you to order. However, you can still adjust the unit to match the requirements of your project.

Both units are configured in the design program SystemairCAD. You can find the technical details on page 11.

The Geniox range is certified by Eurovent. The Eurovent certification is your security that Geniox air handling units meet the technical specifications.



Geniox Comfort

- Modular construction
- Fully customised
- Freedom of choice



Geniox GO

- Compact construction
- Standard configuration
- Quick and easy solution

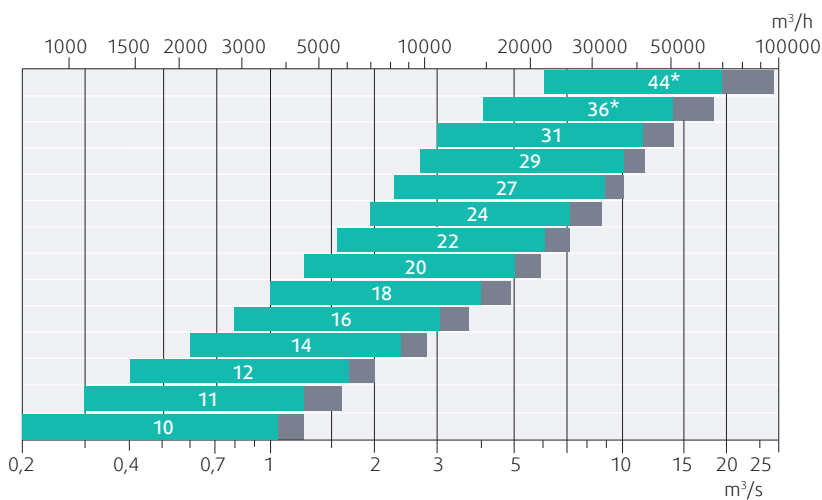
Geniox Comfort



Geniox Comfort is designed as a modular air handling unit. Each function is placed into an air handling unit casing consisting of one or more modules. The modular functions can be configured for many different applications to make up the heart of any ventilation system. The flexibility makes it possible to optimize the air handling unit for each project.

- Geniox Comfort, modular air handling unit: 14 sizes with airflows from 750-70.000 m³/h (0,2-19 m³/s).
- With rotary heat exchanger, run-around coil heat exchangers, cross flow heat exchanger, or counter flow heat exchanger.
- With EC motor IE4, PM motor IE4 or AC motor IE3.
- Plug fan.
- With or without supply air, extract air, or mixing damper.
- Filter classes: G4, M5, M6, F7, F8, F9 or F7 City-Flo.
- With water heating coil, electric heating coil and/or cooling coil.
- Can be supplied with integrated heat pump Geniox U-HP.
- Can be supplied with humidifier/adiabatic cooling Geniox X.
- With or without control system.
- For indoor or outdoor installation.
- Eurovent certified.

Geniox Comfort airflows



■ Airflow range for Geniox Comfort complying with Ecodesign.

■ Full airflow range for Geniox Comfort.

* Not available before 2018.



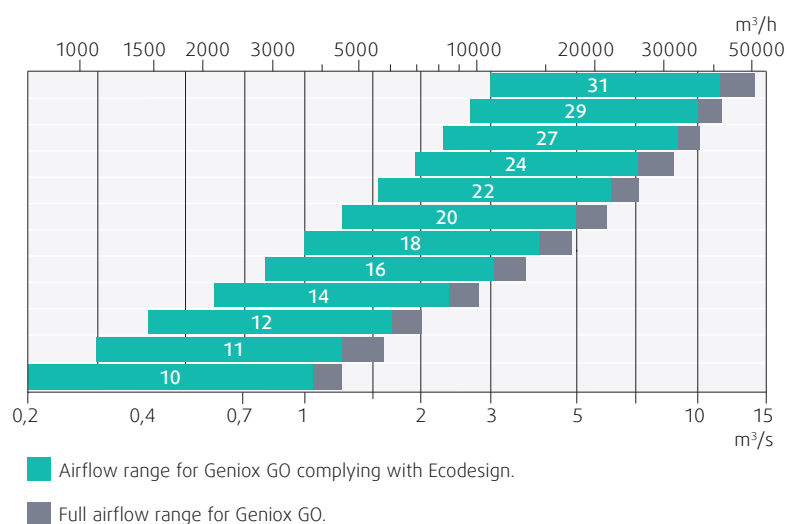
Geniox GO



This pre-configured compact air handling unit with energy saving solutions is available in 12 sizes with airflows from 750-50.000 m³/h. Geniox GO is delivered with rotary, plate or run-around heat exchanger. Geniox GO is based on Systemair's well-known technology in production of air handling units with more than 40 years of experience. Geniox GO is easy to calculate, configure, and order.

- Geniox GO, pre-configured compact air handling units: 12 sizes with airflow capacities 750-50.000 m³/h (0,2-13,8 m³/s).
- With rotary heat exchanger, run-around coil heat exchangers, cross flow heat exchanger, or counter flow heat exchanger.
- With EC motor IE4, PM motor IE4 or AC motor IE3.
- Plug fan.
- With or without supply air, extract air, or mixing damper.
- Filter classes: M5, M6, F7, F9 or F7 City-Flo.
- With water heating coil, electric heating coil and/or cooling coil.
- Can be supplied with integrated heat pump Geniox U-HP.
- With or without control system.
- For indoor or outdoor installation.
- Eurovent certified.

Geniox GO airflows



Geniox, innovative solutions



Casing. The new casing provides the best choice for minimal energy loss.

- Thermal bridging TB2.
- Thermal insulation T2.
- Deflection class D1.
- Air leakage class L2.
- Negative pressure: - 400 Pa.
- Positive pressure: + 700 Pa.

Panels. Elimination of thermal bridges. Separation between inner skin and outer skin (0,8 mm) with 60 mm insulating mineral wool. Density: 60 kg/m³. Pre-painted steel sheets or Aluzinc AZ 185 ensure a corrosion protection class C4 according to the standard EN ISO 12944-2:2000.

Frame/profiles.

- High corrosion resistance
- Externally pre-painted, galvanized steel and closed profiles, 1,0/1,5 mm.
- Internally aluzinc.



Corners. Design in ABS ensures minimal thermal bridging.



Handles and hinges. Practical handles and hinges make it possible to disassemble all panels and provide a space-saving solution that is easy to service.



Service windows. The windows have been designed exclusively for Systemair and provide a large area for easy inspection.



Service and maintenance. All panels, doors and openings have easy access for cleaning and service.

Transportation. Casing design and standard packaging allows for easy transportation.





Roof unit. Geniox are available as roof units, designed for outdoor installation. In this version the unit is assembled on a base frame. The roof unit can be delivered with two different types of roofing:

Steel profile roof, aluzinc protected corrugated steel sheets, and profiles for fastening and finishing the roofing.

PVC roof, very easy to handle and has a good weather protection.



Classifications

The performance of the air handling unit casing corresponds with the following classifications according to the European standard EN 1886, 2nd edition 2008.

Operating pressure

Difference between surrounding and pressure inside the air handling unit:

0 - 2000 Pa (Geniox 10-31)

0 - 1500 Pa (Geniox 36-44).

Operating temperatures

General temperatures for the air in the air handling unit:

Standard design: -40/+40 °C

Special design: -40/+60 °C.

Filter by-pass leakage

Negative pressure:

- 400 Pa: Class G1-F9

Positive pressure:

+ 400 Pa: Class G1-F9.

Directives. Geniox fulfils the following directives:

- Machinery Directive 2006/42/EC
- Ecodesign Directive 1253/2014
- EMC Directive 2014/30/EU
- Low Voltage Directive 2014/35/EU
- Pressure Equipment Directive 2014/68/EU.



Eurovent certification

Geniox is constructed in accordance with European standards and is certified by Eurovent.

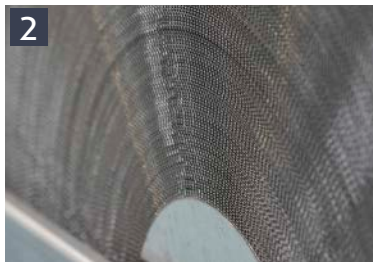
Geniox, innovative solutions



1

The plug fan has the impeller fitted directly to the motor shaft and is built into a soundproof unit casing. The fan is a single inlet, free-blowing fan where the unit casing acts as fan housing. The plug fan has an efficiency of up to

75% and a low noise level. The plug fan can be supplied with EC motor (IE4), PM motor (IE4), or AC motor (IE3). Fan impeller and motor are statically and dynamically balanced.



2

The rotary heat exchanger is supplied in 3 types: Condensation, sorption hybrid and sorption heat exchangers. Generally, the rotary heat exchanger has a high efficiency from 75% to 87% depending on operating conditions. It can recover moisture and is the heat exchanger that requires the least space. The sorption hybrid exchanger recovers more moisture, and therefore contributes to the humidification of the supply air. The sorption exchanger dehumidifies the air more, making it particularly suitable for dehumidifying the outdoor air, for example before cooling.

between the two airflows, and so it can also be used for dehumidification. **The standard cross flow exchanger** has an efficiency of up to 65%. The high efficiency cross flow exchanger has an efficiency of up to 75%. These two types are supplied in two variants: One made of aluminium for comfort and one made of corrosion-resistant plastic-coated aluminium for aggressive environments. **The counter flow exchanger** has an efficiency of up to 90% and is supplied only in aluminium. The heat exchangers are fitted with by-pass for capacity control and have a built-in drip tray.

The plate heat exchanger is supplied in 3 types: Standard, high efficiency and counter flow heat exchangers. Generally, the plate heat exchanger has a high efficiency. It has separated airflows, and thus the transfer of odors to the supply air is avoided. There is no transfer of moisture

The run-around coil heat exchanger has an efficiency of up to 70% and is used, where the two airflows must be kept completely separate, or where the airflows are at a distance from each other. For example on 2 different storeys.



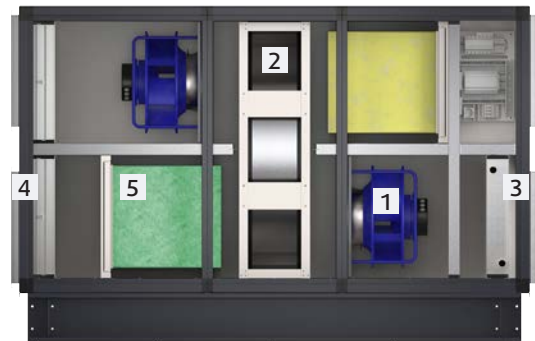
3

The heating coil is used for heating the supply air. The heating can be effected by hot water or condensation of refrigerant. These coils consist of copper tubes and aluminium fins. Heating can also be effected with electricity. These coils consist of heating elements of stainless steel and have built-in safety control system. In the standard version the coils are built into the unit. More variants and options are possible.

evaporative refrigerant. A cooling coil for evaporation has the liquid distributor placed in the unit. These coils consist of copper tubes and aluminium fins. In the standard version, the coils are built into the unit. More variants and options are possible.

The cooling coil is used for cooling the supply air. It can be effected by cold water or direct

The change-over battery is basically a cooling coil for cold water, which can also be used for heating by changing the water temperature from cold to warm as required. Typically used in connection with heat pumps.



The dampers comply with tightness class 4 C according to EN 1751:2014. The dampers have counter rotating aerodynamically shaped damp-

er blades made of aluminium, which ensure a low pressure loss when open.



The compact filter is a basic filter class G4 according to EN 779:2012 with a short building length. It is designed on pleated filter principle. The filter can be used as pre-filter and thereby extend the life of the main filter.

lifetime and thus good overall economy. The filter can be supplied in the filter classes G4, M5, M6, F7, F8, F9 og F7 City-Flo according to EN 779:2012. F7 City-Flo is a filter with particle and molecular filtration specially designed for use in urban areas and areas with heavy traffic.



The bag filter is a bag filter, which design provides a large filter area. The filter has a long

The humidifier is made as a complete unit, which includes humidification elements, tray and frame made of stainless steel AISI 304, circulation pump, irrigation regulation valves, overflow, bleed-off regulation valve, float valve for controlling the water supply to the tray and valve for emptying the tray. The function of the

humidifier is based on the natural process that water evaporates when air passes a wet surface. The humidifier can either be placed in the supply air after a heating coil or used as indirect adiabatic cooling by placing it in the extract air before a heat exchanger.



The heat pump U-HP is an integrated reversible heat pump system built into a unit section. The system consists of a reversible heat pump and a rotary heat exchanger that enables both heating and cooling. The unit is equipped with 2

scroll compressors, and cooling/heating capacity is stepless variable in the range 5-100%. The heat pump is based on R-410A refrigerant. The U-HP is equipped with a complete control system.

The sound attenuator is an absorption attenuator with baffles. It is used to reduce the sound

power level from the air handling unit to the duct system.

Control system

Fully tested control system

Geniox can be supplied with a pre-assembled and fully tested control system. The control system is a user-friendly system, where functions and parameters are selected from the external control panel. The control panel can be positioned freely and used as a remote control.

Easy start-up and continuously displayed data

The most important operating data are continuously displayed on the control panel display, including operating values, operating status, alarms and time settings. Start-up and commissioning is simplified, as the control system has a preloaded application with all needed functions. The functions and settings can easily be changed from the control panel display.

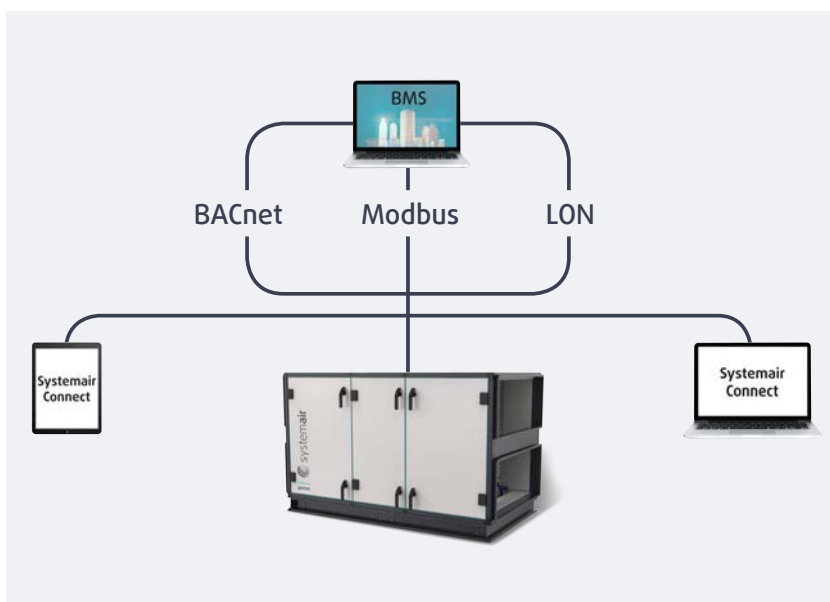
Controller functions

- Multi-language support.
- Weekly clock.
- Real time data.
- Select between:
 - Temperature control: Cascade room control, fixed supply air temperature, outdoor compensated supply air temperature, outdoor temperature dependent change between room control and supply air control.
 - Fan control: Fixed airflow, constant duct pressure (VAV), constant duct pressure with extract air as slave.
- Energy monitoring.
- Extended operation.
- Free night cooling.
- Cooling recovery.
- Filter guard for supply and extract air.
- Alarm and safety functions.
- Readout of fan data: Airflow and pressure.

- Water heating coil, control and frost protection.
- Electric heating coil, modulating with protection against overheating as well as control.
- Cooling coil, control.
- Run-around coil heat exchangers, control.
- Recirculation.
- Heating and cooling valves incl. actuator.
- Control/communication of DVU-HP heat pump.
- Supply air and extract air dampers as well as damper motors.
- External fire signal.
- Co₂/temperature control.
- Humidity control.

BMS communication

- BMS communication, easily configured via the external control panel.
- Integrated web server – TCP/IP.
- BACnet – TCP/IP.
- Modbus – RS485.
- Modbus – TCP/IP.
- LON can be added.
- Systemair Connect, cloud access for complete control of your Geniox unit.



SystemairCAD

Geniox units are designed in SystemairCAD, a design program which ensures an optimal dimensioning of the unit's functions. When the unit design is finished, SystemairCAD makes a technical calculation and automatically generates a complete technical documentation in pdf format for the selected unit. Download the program on Systemair's website.

The documentation includes the following highlights:

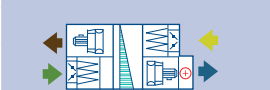
- Frontpage with a summary of the most important technical data of the selected unit.
 - Detailed drawing of the unit's construction and dimensions.
 - Sound power level.
 - Technical specifications of all components.
 - Shipping, dimensions and weights.
 - The control system including flowchart.
 - Molliere diagram with summer and winter conditions.
 - Complete consultant text.
- Compliance with ErP 2016/2018 including full documentation.
 - LCC calculations.

The drawn to scale drawings from SystemairCAD can be exported to other CAD software and for use in BIM. Following options exist:

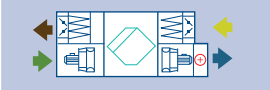
- Export of DXF files 2D and 3D.
- Export of DMR files to Autodesk Revit.
- SystemairCAD project files can be opened directly in AutoCAD via MagiCAD plugin and in Autodesk Revit via Revit plugin.



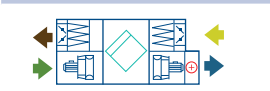
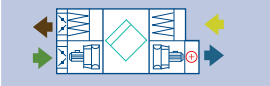
Quick selection Geniox Comfort

Rotary heat exchanger		Unit size											
		10	11	12	14	16	18	20	22	24	27	29	31
Unit	Width	1082	1182	1282	1482	1682	1882	2082	2282	2482	2782	2982	3182
Unit 	Height*	1082	1182	1282	1482	1682	1882	2082	2282	2482	2764	2964	3164
	Length	2264	2264	2264	2264	2464	2664	3064	3264	3064	2962	3262	3482


The above dimensions and weights are a guideline only. Accurate values and combinations are calculated in SystemairCAD.
* Height excl. legs/base frame.

Plate heat exchanger Counter flow heat exchanger		Unit size						
		10	11	12	14	16	18	20
Unit	Width	1082	1182	1282	1482	1682	1882	2082
Unit 	Height*	1082	1182	1282	1482	1682	1882	2082
	Length	3264	3464	3564	3564	4064	4264	4664

The above dimensions and weights are a guideline only. Accurate values and combinations are calculated in SystemairCAD. * Height excl. legs/base frame.

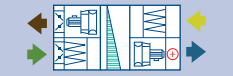
Plate heat exchanger Cross-flow exchanger		Unit size											
		10	11	12	14	16	18	20	22	24	27	29	31
Unit	Width	1082	1182	1282	1482	1682	1882	2082	2282	2482	2782	2982	3182
Unit 	Height*	1082	1182	1282	1482	1682	1882	2082	2282	2482	2764	2964	3164
	Length	3264	3164	3364	3464	3764	3964	4464	5164	4964	4882	5882	6082
Unit 	Length	3564	3464	3964	4064	4464	4664	5264	5964	5864	5782	6982	7182

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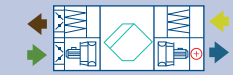
Integrated reversible heat pump		Unit size								
		10	11	12	14	16	18	20	22	24
Unit	Width	1082	1182	1282	1482	1682	1882	2082	2282	2482
Unit 	Height*	1082	1182	1282	1482	1682	1882	2082	2282	2482
	Length	3364	3364	3364	3364	4164	4364	4864	5164	4964

The above dimensions and weights are a guideline only. Accurate values and combinations are calculated in SystemairCAD. * Height excl. legs/base frame.

Quick selection Geniox GO

Rotary heat exchanger		Unit size											
		10	11	12	14	16	18	20	22	24	27	29	31
Unit	Width	1082	1182	1282	1482	1682	1882	2082	2282	2482	2782	2982	3182
Unit 	Height*	1082	1182	1282	1482	1682	1882	2082	2282	2482	2782	2982	3182
	Length	2182	2182	2282	2582	2782	2282	2582	2782	3082	3082	3382	3382

The above dimensions and weights are a guideline only. Accurate values and combinations are calculated in SystemairCAD.
* Height excl. legs/base frame.

Plate heat exchanger Counter flow heat exchanger		Unit size						
		10	11	12	14	16	18	20
Unit	Width	1082	1182	1282	1482	1682	1882	2082
Unit 	Height*	1082	1182	1282	1482	1682	1882	2082
	Length	3182	3282	3682	3882	4382	3982	4282

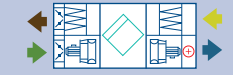
The above dimensions and weights are a guideline only. Accurate values and combinations are calculated in SystemairCAD.* Height excl. legs/base frame.

Design an air handling unit


Geniox contains countless combination options. To ease the process of designing a unit the most popular combinations are illustrated here.

Key to symbols

- Exhaust air 
- Outdoor air 
- Extract air 
- Supply air 

Plate heat exchanger Cross-flow exchanger		Unit size											
		10	11	12	14	16	18	20	22	24	27	29	31
Unit	Width	1082	1182	1282	1482	1682	1882	2082	2282	2482	2782	2982	3182
Unit 	Height*	1082	1182	1282	1482	1682	1882	2082	2282	2482	2782	2982	3182
	Length	2782	2982	3282	3682	3982	3581	4082	4782	4982	4982	5882	5882

The above dimensions and weights are a guideline only. Accurate values and combinations are calculated in SystemairCAD.
* Height excl. legs/base frame.

Integrated reversible heat pump		Unit size								
		10	11	12	14	16	18	20	22	24
Unit	Width	1082	1182	1282	1482	1682	1882	2082	2282	2482
Unit 	Height*	1082	1182	1282	1482	1682	1882	2082	2282	2482
	Length	1882	2882	3082	3282	4082	3682	4182	4482	4682

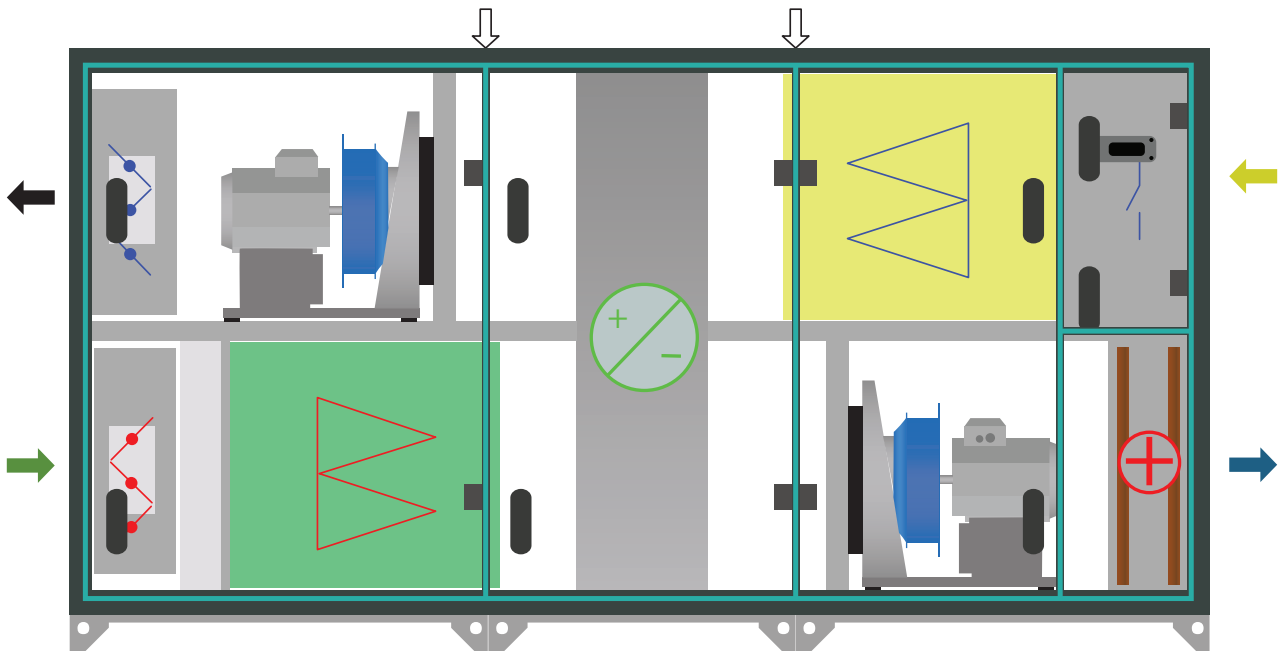
The above dimensions and weights are a guideline only. Accurate values and combinations are calculated in SystemairCAD. * Height excl. legs/base frame.

Geniox naming key

As the first step, Geniox is named after unit size which is calculated in SystemairCAD where a product property guide will guide the user to the right unit size e.g. **14**, which means the unit will be 1400 mm + 82 mm high + base frame.

In example 1 the unit is built in a double high casing (**D**) with partition floor. Supply air is placed to the right as seen from inspection side (**R**). The name of the unit is therefore **14DR**.

	14	D	R
14	Modular unit size		
D	Double high casing		
S	Stacked		
R	Right (supply air)		
L	Left (supply air)		



Example 1: 14DR, Geniox 14, double high casing, supply air right.

Standards and certifications



The Geniox design is based on the demands in the following CEN and ISO standards:

EN 305:1997

Heat exchangers. Definition and test procedures.

EN 308:1997

Heat exchangers. Test procedures.

EN 779:2012

Particulate air filters for general ventilation. To be replaced with EN ISO 16850 1:2016, in 2018.

EN 1216:1999

Heat exchangers.

EN 1751:2014

Aerodynamic testing of dampers and valves.

EN 1886:2008

Air handling units.
Mechanical performance.

EN 13053:2011

Ratings and performance for units and components.

EN 13779:2007

Ventilation for non-residential buildings. Performance requirements.

EN 60204-1:2006

Machine safety.
Electrical equipment of machines.

EN ISO 3741:2010

Determination of sound power level in reverberation rooms.

EN ISO 5136:2009

Determination of sound power level in a duct.

EN ISO 12100:2011

Safety of machinery.

EN ISO 12944-2:2000

Corrosion protection. Classification of environments.

EN 378-1&2-2016

Refrigerating systems and heat pumps safety and environmental requirements.

Eurovent certification

Geniox air handling units are Eurovent certified. This ensures the conformity between the calculated performance in SystemairCAD design programme, and the measured performance at independent test laboratories. Certificate 17.07.012 and 17.07.013.

Machinery directive

Geniox air handling units are manufactured according to the safety demands of the EU Machinery Directive 2006/42/EF. This is confirmed through the issuance of corresponding Declaration of Conformity and CE label.



Ecodesign Directive

The Ecodesign Directive 1253/2014 prescribes minimum requirements regarding heat recovery efficiency, fan efficiency, SFP internal values, and operation of the air handling unit. The selection software SystemairCAD is updated with an automatic Ecodesign calculation that will tell you whether the requirements for both 2016 and 2018 are fulfilled.

Eurovent energy classification

Geniox air handling units are energy classified according to Eurovent's guidelines for air handling units RC 6/C/005-2017. The energy class expresses the unit's total energy consumption. The energy class is calculated by the design program SystemairCAD based on the actual data of the designed unit.

