This catalogue presents a technical description of the Geniox air handling unit, its components and accessories. Geniox is designed as a modular air handling unit. Each function is placed into an air handling unit casing consisting of one or more modules. It is available in 12 sizes with airflows from 750 to 48,000 m³/h (0.2-13.3 m³/s).

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 SystemairCAD on Systemair’s website.
**Contents**

- Comfort ventilation by Systemair ...................................................... 4
- Geniox .................................................................................................... 6
- Geniox, innovative solutions ................................................................. 8
- Geniox functions .................................................................................. 10
- Systemair Access; Complete control system ........................................ 12
- Configure Geniox with SystemairCAD .................................................. 13
- Quick selection of Geniox .................................................................... 14
- Directives and certifications ................................................................. 16
- Standards .............................................................................................. 17
- Geniox casing ........................................................................................ 18
- Roof unit ............................................................................................... 20
- Pre-painted unit .................................................................................... 21
- Plug fan ................................................................................................ 22
- Rotary heat exchanger .......................................................................... 24
- Plate heat exchanger ............................................................................ 26
- Run-around coil heat exchangers ............................................................ 28
- Heating coil ........................................................................................... 29
- Cooling coil ........................................................................................... 30
- Change-over coil .................................................................................. 31
- Integrated reversible heat pump .............................................................. 32
- Air humidifier ......................................................................................... 34
- Panel filter ............................................................................................... 36
- Bag filter ................................................................................................ 37
- Metal filter .............................................................................................. 38
- Carbon filter .......................................................................................... 39
- Damper .................................................................................................. 40
- Sound attenuator .................................................................................. 42
- Inspection section .................................................................................. 43
- Empty section ......................................................................................... 44
- Outdoor air section ................................................................................ 45
- Supporting legs ...................................................................................... 46
- Standard base frame and base frame with high legs ............................... 47
- Base frame with forklift holes ................................................................. 48
- Assembly brackets ............................................................................... 49
- Duct connection part ............................................................................. 50
Comfort ventilation by Systemair

Comfort ventilation describes the ventilation systems most often used in hospitals, hotels, schools, and offices. The purpose of this ventilation system is to create a healthy and comfortable indoor climate. Geniox is designed in flexible modules. This gives you the freedom to choose precisely the features that you need.
As a rule of thumb, ventilation accounts for 40% of a building’s energy consumption. That means there is a significant potential for improvement. Geniox aims to exploit that potential and reduce the percentage. Geniox air handling units feature the most energy efficient motors. The unit employs the latest advances in energy recovery technology, and the casing is designed to reduce any energy loss in the process.

The design program SystemairCAD will always inform you of the projected energy class of your chosen unit. In SystemairCAD, you also have the possibility to calculate the lowest energy consumption combined with the best possible fan for VAV operation by applying alternative operating points. SystemairCAD calculations are certified by Eurovent.

- Modular construction.
- Fully customised.
- Freedom of choice.
- Robust design.
- High air tightness.
- High efficiency.
- Easy to select, order, and install.
- Safe and precise delivery.
Geniox

Geniox 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.

- Genioxx, modular air handling unit:
  12 sizes with airflows 750-48,000 m³/h (0.2-13.3 m³/s).
- With rotary heat exchanger, run-around coil heat exchangers, cross flow heat exchanger, or counter flow heat exchanger.
- Plug fan with EC motor IE5, PM motor IE4, or AC motor IE3.
- Filter classes: Coarse 65% (G4), ePM10 60% (M5), ePM2.5 50% (M6), ePM1 60% (F7), ePM1 70% (F8), ePM1 85% (F9), CITY-FLO ePM1 60% (F7 City-Flo), metal filter (G2) or carbon filter.
- With water heating coil, electric heating coil, and/or cooling coil.
- Can be supplied with integrated heat pump.
- Can be supplied with humidifier/adiabatic cooling.
- With Systemair Access control system, without control system, or Controller Ready.
- For indoor or outdoor installation.
- Eurovent certified.

Geniox airflows

The above airflows are calculated with rotary heat exchanger and EC motors.
Geniox, innovative solutions

Casing
- Thermal bridging class TB2.
- Thermal insulation class T2.
- Deflection class D1.
- Air leakage class L1.

Official model box
EN 1886 results.

Panels. Elimination of thermal bridges. Separation between inner sheet and outer sheet (0.8 mm) with 60 mm insulating mineral wool. Density: 60 kg/m³. Aluzinc AZ 185 or pre-painted steel sheets in black RAL 9005 or in light grey RAL 7035 ensure a corrosion protection class C4 according to the standard EN ISO 12944-2:2000.

Frame profiles.
- Corrosion class C4.
- Powder-painted Z275 galvanized profiles inside, 1.0/1.5 mm.

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

Inspection windows. The windows have been designed exclusively for Systemair and provide a large area for easy inspection.
Directives. Geniox fulfills 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.

Operating pressure
Difference between external and internal pressure: 0 - 2000 Pa.

Operating temperatures
Standard design: -40/+40 °C
Special design: -40/+60 °C.

Service and maintenance. All doors provide easy access for cleaning and service.

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

Roof unit. Geniox is available as roof unit, designed for outdoor installation. In this version the unit is assembled on a base frame. The roof unit can be delivered with three different types of roof:
- Steel profile roof. Aluzinc protected corrugated steel sheets and profiles for fastening and finishing the roof.
- Rubber sheeting roof and bitumen membrane roof, very easy to handle and has a good weather protection.
- Pre-painted unit. Black RAL 9005 or light grey RAL 7035. Frame profiles in RAL 7024 for both solutions.

Pre-painted unit.
Black RAL 9005 or light grey RAL 7035. Frame profiles in RAL 7024 for both solutions.

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

The plug fan has the impeller fitted with air foiled blades to obtain the highest possible efficiency. The fan is a single inlet, free blowing fan where the unit casing acts as fan housing. The plug fan has a static efficiency of up to 75%. The plug fan can be supplied with EC motor (IE5), PM motor (IE4), or AC motor (IE3). Fan impeller and motor are statically and dynamically balanced.

The rotary heat exchanger is available in three variants: Condensation, sorption hybrid and sorption heat exchanger. 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.

The plate heat exchanger is available in two variants: Cross flow and counter flow heat exchangers. Generally, the plate heat exchanger has a high efficiency. It has separated airflows, and thus the transfer of odours to the supply air is avoided. There is no transfer of moisture between the two airflows.

The cross flow exchanger has an efficiency of up to 85% depending on air speed and unit size. It is made of aluminium for comfort.

The counter flow exchanger has a efficiency of up to 90% and is supplied only in aluminium. The heat exchangers are fitted with by-pass for capacity control and for frost protection, and have a built-in drip tray with slope.

The run-around coil heat exchangers have an efficiency of up to 80% depending on air speed through the coil, and are used, where the two airflows must be kept completely separate, or where the airflows are in different places.

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 by electricity. These coils consist of heating elements of stainless steel and have built-in safety control system.

The cooling coil is used for cooling the supply air. It can be effected by cold water or direct evaporative refrigerant. A cooling coil for evaporation has the liquid distributor placed in the unit. These coils consist of copper tubes and aluminium fins.

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

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 panel filter is a basic filter class Coarse 65% (G4) according to EN ISO 16890 with a short building length. It is designed on pleated filter principle. The bag filter is a bag filter, which design provides a large filter area. The filter has a long lifetime and thus good overall economy. The filter can be supplied in the filter classes Coarse 65% (G4), ePM10 60% (M5), ePM2.5 50% (M6), ePM1 60% (F7), ePM1 70% (F8), ePM1 85% (F9), or CITY-FLO ePM1 60% (F7 City-Flo) according to EN ISO 16890. CITY-FLO ePM1 60% is a filter with particle and molecular filtration, specially designed for use in urban areas and areas with heavy traffic. Bag filters are available in 2 lengths; 520 and 640 mm. Metal filter. Class G2. Carbon filter. Carbon type CEX003 in a cylindrical cartridge.

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 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. Can be delivered for dry and wet cleaning.
Systemair Access; Complete control system

Systemair Access is the complete control system for Geniox. Access has been developed by Systemair for Geniox air handling units. Access can be controlled with the NaviPad control panel.

We have selected the most important functions for NaviPad to make it simple and user-friendly for you. NaviPad has an intuitive user interface, as you know from your smartphone. It is easy to gain an overview of the Access controller where you can connect all external components.

- The NaviPad control panel has a 7” touch screen.
- We have developed a logical navigation structure, inspired by smartphones.
- Name and connect up to 9 air handling units to the same control panel.
- BMS communication via ModBus, BACnet as well as cloud access to Systemair Connect.
- Dynamic flow chart: Press the function, change the setting and go!
- Quickly and safely connect external sensors to the controller.
- Editable name on external components for better overview.
- Plug and play – prepared for easy start-up and operation.
Configure Geniox with SystemairCAD

SystemairCAD is a user-friendly design program which ensures an optimal dimensioning of the air handling 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.

The documentation includes the following highlights:
- Technical data
- Detailed drawing
- Shipping, dimensions and weights
- Control system description like control functions, flow chart and connection diagrams
- Molliere diagram
- Specification text
- ErP 2018
- LCC calculations.

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

Download SystemairCAD from Systemair’s website.
Quick selection of Geniox

**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
- Extract air
- Outdoor air
- Supply air

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### Rotary heat exchanger

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<th>Unit size</th>
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* Height excl. legs/base frame.

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### Plate heat exchanger

**Counter flow heat exchanger**

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* Height excl. legs/base frame.

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### Plate heat exchanger

**Cross flow heat exchanger**

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* Height excl. legs/base frame.

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### Integrated reversible heat pump

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* Height excl. legs/base frame.
Directives and certifications

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

**Eurovent energy classification**
Geniox air handling units are energy classified according to Eurovent’s guidelines for air handling units. 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.

**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 if the requirements for 2018 are fulfilled.

**Machinery directive**
Geniox air handling units are manufactured according to the safety demands of the EU Machinery Directive 2006/42/EC. This is confirmed through the issuance of corresponding Declaration of Conformity and CE label.
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 378-1&2:2016**
Refrigerating systems and heat pumps safety and environmental requirements.

**EN ISO 16890**
Air filters for general ventilation.

**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.

**DS 428**
Danish Standard for fire technical precautions, indoor air handling units comply with class A2-s1,d0.
**Geniox casing**

**Air handling unit casing**
The casing protects the inside functions and is very effective for thermal and sound insulation.

**Thermal insulation**
Class T2. Sound and thermal insulating mineral wool, which is completely encapsulated between two steel sheets. Thickness: 60 mm. Density: 60 kg/m³.

**Thermal bridging factor**
Class TB2.

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**Deflection**
Class D1.

**Air leakage**
L1.

**Mechanical performances** are the results of official model box test (EN 1886).

**Operating pressure**
Difference between external and internal pressure: 0 - 2000 Pa.

**General temperatures**
General temperatures for air in the air handling unit:
Standard design: -40/+40 °C
Special design: -40/+60 °C.

**Frame profiles and corners.** Geniox is constructed using a framing profile, 1.0/1.5 mm. The frame profiles are made of Z275 galvanized profiles inside and externally powder-painted. The result is a strong and robust construction able to resist twisting and lateral movement, making the unit extremely stable and strong. The design of the corners is ABS which ensures minimal thermal bridging.

**Panels.** The panels of Geniox are built using a sandwich construction with double sheets and 60 mm mineral wool for sound and heat insulation. The mineral wool is completely encapsulated, since the panels are closed on all sides. The panels with Aluzinc AZ 185 surface are not only highly corrosion-resistant, but present an attractive, uniform appearance that can last for many years. The panels are also available as pre-painted steel sheets in black RAL 9005 or light grey RAL 7035. The frame profiles are always pre-painted in RAL 7024. The Aluzinc AZ 185 and the pre-painted steel sheet ensure a corrosion protection in class C4 according to EN ISO 12944-2:2000.

**Handles and hinges.** Practical handles and hinges make it possible to disassemble all doors and provide a space saving solution that is easy to service. All doors will have one handle with a lock. Doors with 2 handles: Lock placed in top handle. Doors with 3 handles: Lock placed in middle handle. Doors with 4 handles: Lock placed in one of the middle handles. Stacked air handling unit: The lock will be placed in the bottom handle of the top doors.
Filter by-pass leakage
Class F9 according to EN 1886.

Free area in front of and above the unit
When positioning the unit, we recommend that an area in front of the inspection side with the same width as the unit is kept free for service and inspection and also for replacement of fans, heat exchanger, and coils, if needed.

For safe access to the cabinet with electrical components, if placed on top of the unit, the free area from the upper edge of the cabinet to the ceiling must be at least 700 mm.

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

Assembly brackets. A Geniox air handling unit consisting of several sections can be quickly and efficiently assembled by using the assembly brackets on the outside.

Inspection doors. Geniox has large inspection doors, making service access easy. The doors are mounted using solid hinges with easily removable pins. This means that the doors can be easily removed, if there is no room for normal opening of the doors. The doors are sealed using rubber profiles and have heavy-duty handles with minimum 1 lock on each door. They can only be locked and unlocked using a key.
Roof unit

The Geniox air handling unit is available as a roof unit for outdoor installation.

Function
For the outdoor installation the unit is assembled on a base frame and features a roof construction which together with the double sealing of the panels provides protection against the effects of the weather.

The roof unit can be delivered with three different types of roof:

Bitumen membrane roof
Manufactured of polyester, reinforced bitumen material fitted to the unit by a heating process. The bitumen roof is a very close and robust roofing completely finished from factory.

Rubber sheeting roof
Manufactured of rubber fitted to the unit by a glueing process. The rubber roof is a very tight and robust roof completely finished from factory. The colour of the rubber roof is light grey.

Steel profile roof
Manufactured of Aluzinc protected, corrugated steel sheets, and profiles for fastening and finishing the roof. This type of roof is supplied for local assembly on the air handling unit. The steel profile roof is a robust roof.

Air intake and exhaust are available with louvers for effective protection against rain and snow. We recommend placing the exhaust air on the back of the unit by adding an outdoor air section. Exhaust can also be placed above air intake in the end of the unit.
Pre-painted unit

The Geniox air handling unit is available with black or light grey pre-painted steel sheets.

**Function**
The black variant of Geniox is especially suitable for outdoor units when a good blending in with a dark facade and dark roof is required. The light grey variant is well-suited for both indoor and outdoor installation with a fine and even look.

**Variants**
The sheets are made of pre-painted galvanized steel sheets in black (RAL 9005, gloss 30) or light grey (RAL 7035, gloss 30). When ordering air intake and outlet with louvers these are also painted in black (RAL 9005, gloss 30) or light grey (RAL 7035, gloss 30).

When choosing rubber sheeting roof or bitumen membrane roof, the roof lining will also be in black or light grey.

The frame profiles and corners will be delivered in RAL 7024 as standard for both solutions. The baseframe can be delivered in RAL 7024 for both solutions.

For all variants of the Geniox unit apply that they all come with green panel gaskets. Duct connections will not be painted.
Plug fan

The plug fan is built into an acoustically insulated air handling unit.

Construction
Single inlet plug fan with open outlet into the air handling unit. The fan impeller is fitted directly to the motor. Static efficiency up to 75%. To optimise the plug fan efficiency in the operating point, the fans can be selected in several variations:
- S: Low airflow
- M: Medium airflow
- L: High airflow.

Variants
The plug fan comes in two variants:

EC Bluefin
Compact plug fan with an effective composite impeller, where all details are optimised in order to achieve a high efficiency. The impeller is fitted directly to an EC external rotor motor with integrated variable speed control. The EC motor is in efficiency class IE5. An EC motor is characterized by a high efficiency and excellent control features. Several fans can be positioned in parallel operation at larger units. The fans are mounted on vibration steel springs on the bottom of the fan section.

PM/AC
Plug fan with an effective impeller fitted to the motor shaft. Depending on size, the impeller is made of composite material or painted steel. PM and AC motors are stepless controllable via frequency converter. Two fans can be positioned in parallel operation at larger units. The fans are mounted on vibration steel springs on the bottom of the fan section.

The PM/AC fan can be supplied with two types of motors for 3 x 400 V AC:

PM: Permanent magnet – synchronous motor. Efficiency class IE4 according to EN 60034-31. The motor has a very high efficiency. The rotor is made of magnetic material, which eliminates the slip and reduces heat generation and losses in the motor. Two frequency converters with the same control signal control parallel operation of twin fans.


Positioning in the air handling unit
A plug fan supplies air at the fan section outlet with a low and even air speed. Therefore, it is an advantage to position air handling components on the outlet side of the fan.

Service-friendly
The plug fan has a large inspection door providing easy access for service. The plug fan PM/AC in sizes 10-14 has the fan and motor assembled on guide rails, which allow easy extraction from the unit.

Sound data
The design program SystemairCAD calculates the fan sound power level Lw (ref. 1 pW). The calculations are based on measurements carried out according to the following standards:
- EN ISO 5136:2009, Determination of sound power level in a duct.
- EN ISO 3741:2010, Determination of sound power level in reverberation rooms.
SystemairCAD also calculates the sound power levels for all duct connections to the unit.
Balancing
The fan is balanced both statically and dynamically.

Operating temperatures
Temperature range: -10/+40 °C.

Airflow calculation
The inlet cone is equipped with a pressure nozzle. This can be used to determine the current airflow using the K-factor and the formula:

\[ V = \sqrt{\Delta P_m \times K} \]

- **V** = Airflow in m³/h
- **ΔP_m** = Measured pressure in Pa (according to sketch)
- **K** = K-factor for the current fan (according to table).

### Plug fan EC Bluefin

<table>
<thead>
<tr>
<th>Impeller ø mm</th>
<th>Material</th>
<th>K-factor</th>
<th>Fan type EC Bluefin</th>
</tr>
</thead>
<tbody>
<tr>
<td>250</td>
<td>Composite</td>
<td>67</td>
<td>10-S, 11-S</td>
</tr>
<tr>
<td>280</td>
<td>Composite</td>
<td>85</td>
<td>10-M</td>
</tr>
<tr>
<td>310</td>
<td>Composite</td>
<td>106</td>
<td>10-L, 11-M, 12-S</td>
</tr>
<tr>
<td>350</td>
<td>Composite</td>
<td>140</td>
<td>11-L, 12-M, 14-S</td>
</tr>
<tr>
<td>400</td>
<td>Composite</td>
<td>180</td>
<td>12-L, 14-M, 16-S</td>
</tr>
<tr>
<td>450</td>
<td>Composite</td>
<td>220</td>
<td>14-L, 16-M, 18-S</td>
</tr>
<tr>
<td>500</td>
<td>Composite</td>
<td>280</td>
<td>16-L, 20-S</td>
</tr>
<tr>
<td>560</td>
<td>Composite</td>
<td>355</td>
<td>18-M, 20-M, 22-S</td>
</tr>
<tr>
<td>2 x 450</td>
<td>Composite</td>
<td>440</td>
<td>18-L, 20-L, 22-M, 24-S</td>
</tr>
<tr>
<td>2 x 500</td>
<td>Composite</td>
<td>560</td>
<td>27-S</td>
</tr>
<tr>
<td>2 x 560</td>
<td>Composite</td>
<td>710</td>
<td>22-L, 24-M, 27-M, 29-S</td>
</tr>
<tr>
<td>3 x 500</td>
<td>Composite</td>
<td>840</td>
<td>24-L, 27-L, 29-M, 31-S</td>
</tr>
<tr>
<td>3 x 560</td>
<td>Composite</td>
<td>1065</td>
<td>29-L, 31-M</td>
</tr>
<tr>
<td>4 x 500</td>
<td>Composite</td>
<td>1120</td>
<td>31-L</td>
</tr>
</tbody>
</table>

### Plug fan PM/AC

<table>
<thead>
<tr>
<th>Impeller ø mm</th>
<th>Material</th>
<th>K-factor</th>
<th>Fan type PM/AC</th>
</tr>
</thead>
<tbody>
<tr>
<td>220</td>
<td>Steel</td>
<td>47</td>
<td>10-S</td>
</tr>
<tr>
<td>250</td>
<td>Composite</td>
<td>60</td>
<td>10-M, 11-S</td>
</tr>
<tr>
<td>280</td>
<td>Composite</td>
<td>75</td>
<td>10-L, 11-M</td>
</tr>
<tr>
<td>310</td>
<td>Composite</td>
<td>95</td>
<td>11-L, 12-S</td>
</tr>
<tr>
<td>350</td>
<td>Composite</td>
<td>121</td>
<td>12-M, 14-S</td>
</tr>
<tr>
<td>400</td>
<td>Composite</td>
<td>154</td>
<td>12-L, 14-M, 16-S</td>
</tr>
<tr>
<td>450</td>
<td>Composite</td>
<td>197</td>
<td>14-L, 16-M, 18-S</td>
</tr>
<tr>
<td>500</td>
<td>Composite</td>
<td>252</td>
<td>16-L, 18-M, 20-S</td>
</tr>
<tr>
<td>560</td>
<td>Composite</td>
<td>308</td>
<td>18-L, 20-M, 22-S</td>
</tr>
<tr>
<td>2 x 450</td>
<td>Composite</td>
<td>394</td>
<td>20-L</td>
</tr>
<tr>
<td>2 x 500</td>
<td>Composite</td>
<td>381</td>
<td>22-L, 24-M, 27-S</td>
</tr>
<tr>
<td>2 x 560</td>
<td>Composite</td>
<td>504</td>
<td>22-L, 24-M, 27-S</td>
</tr>
<tr>
<td>2 x 630</td>
<td>Composite</td>
<td>616</td>
<td>24-L, 27-M, 29-S</td>
</tr>
<tr>
<td>2 x 710</td>
<td>Composite</td>
<td>762</td>
<td>27-L, 29-M, 31-S</td>
</tr>
<tr>
<td>2 x 800</td>
<td>Steel</td>
<td>980</td>
<td>29-L, 31-M</td>
</tr>
<tr>
<td>2 x 800</td>
<td>Steel</td>
<td>1240</td>
<td>31-L</td>
</tr>
</tbody>
</table>
Rotary heat exchanger

Regenerative heat exchanger with high efficiency.

**Versions**
The rotary heat exchanger is available in 4 versions:
- A: Low pressure drop = standard efficiency
- B: Normal pressure drop = normal efficiency
- C: Medium high pressure drop = medium high efficiency
- D: High pressure drop = high efficiency

**Variants**
The rotary heat exchanger is available in 3 variants: Condensation, sorption hybrid, and sorption heat exchanger.

**SH - Sorption hybrid exchanger:**
Winter: This variant has a hygroscopic surface so that recovery of heat and moisture is possible before condensation. In this way, high extract air enthalpy content can contribute to the heating and humidification of the supply air.
Summer: Recovery of cooling energy from the extract air and light dehumidification of outdoor air before cooling. Available in version: A, B, and D.

**HM - Sorption heat exchanger:**
Winter: Recovery of heat and moisture from the extract air. In this way, high extract air enthalpy content can deliver a large contribution to the heating and humidification of the supply air.
Summer: Recovery of cooling energy from the extract air and dehumidification of outdoor air before cooling. Large power savings for cooling can be achieved hereby as less energy is required for condensation loss on the cooling coil. Available in version: A, B, C, and D.

**Rotor**
The rotor is made with a hub with bearings and two layers of aluminium. The first layer is smooth and the second is corrugated. The two layers are rolled up to the required outer diameter, and then fixed in a very stable construction. The height of the corrugation determines the pressure drop as well as the mass of the rotor and thus also the efficiency. Foil width is 200 mm.

**Sealing**
In order to safeguard against leakage between the airflows, the heat exchanger is fitted with highly effective brush type seals.

**Service-friendly**
The heat exchanger is equipped with a large inspection door. The exchangers in sizes Geniox 10 to 16 can be pulled out for inspection.

**Division of large heat exchangers**
On account of transport the exchangers from size 22 can be supplied divided in the height.
The lower half of the exchanger and the hub of the rotor are assembled into the lower half of the AHU casing. All other parts of the heat exchanger are supplied for local assembly.

**Purging sector**

The exchanger is with a purging sector that flushes the rotor matrix with outside air before it rotates into the supply air duct. In this way only outside air is present in the matrix, and the carry over of exhaust air to supply air is minimised.

**Drive system**

An electronic control unit and a slow rotating motor drive the exchanger. This provides an accurate and stepless regulation of the rotor speed. In this way the exchanger efficiency is controlled. The drive system can also be set up for constant speed. In this way the exchanger provides full heat recovery when it is in operation.

**Mains connection**

1 x 230 V, 50/60 Hz.

**Operation indication**

The control unit has a LED that indicates the actual operating situation.

**Control signal**

The control unit can be regulated by an external 0-10 VDC control signal. For condensation and sorption hybrid heat exchanger 0-10 V corresponds to 0-12 rpm, and for sorption heat exchanger to 0-20 rpm.

**Alarm connections**

Built-in relay for connection to an alarm system. By an undesirable operating situation an alarm is triggered.

**Protection**

Built-in protection against unstable voltage supplies from the mains. Built-in overcurrent protection, which protects the motor against overloading.

**Rotary alarm switch**

Built-in system for monitoring the rotor operation position. Gives a signal by way of an alarm connection, if the rotor operation is interrupted unintentionally.

**Purging**

Outside of the normal operating period the rotor is turned slowly 12 sec. every 15 min. in order to purge the rotor with clean air.

**Cooling recovery**

The heat exchanger can be activated for the recovery of cooling energy via the external control signal.

---

**Data for rotor drive system, condensation and sorption hybrid exchangers**

<table>
<thead>
<tr>
<th>Unit size</th>
<th>Motor</th>
<th>Power, W</th>
<th>Control unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type</td>
<td>Torque, Nm</td>
<td>Voltage, V</td>
</tr>
<tr>
<td>10-18</td>
<td>90 TYD-M</td>
<td>2,8</td>
<td>85</td>
</tr>
<tr>
<td>20-31</td>
<td>120 TYD-M</td>
<td>5,5</td>
<td>145</td>
</tr>
</tbody>
</table>

**Data for rotor drive system, sorption heat exchanger**

<table>
<thead>
<tr>
<th>Unit size</th>
<th>Motor</th>
<th>Power, W</th>
<th>Control unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type</td>
<td>Torque, Nm</td>
<td>Voltage, V</td>
</tr>
<tr>
<td>10-14</td>
<td>90 TYD-M</td>
<td>2,8</td>
<td>85</td>
</tr>
<tr>
<td>16-22</td>
<td>120 TYD-M</td>
<td>5,5</td>
<td>145</td>
</tr>
<tr>
<td>24-31</td>
<td>120 TYD-L</td>
<td>7,5</td>
<td>370</td>
</tr>
</tbody>
</table>

Mains electrical connection must not be cut-off outside the normal operating period, as this will terminate the purging function.
Plate heat exchanger

Recuperative plate heat exchanger with high efficiency.

**Application**
The plate heat exchanger is used where there are special requirements for separation of the two airflows, e.g. in order to avoid transfer of odours to the supply air. The heat exchangers are made of seawater resistant aluminium for use in environments where no corrosive elements are present in the air to corrode aluminium.

**Variants**
- Cross flow heat exchanger (x).
  Unit sizes 10-31.
  Efficiency of up to 85%, depending on heat exchanger version and on operation conditions.
- Counter flow heat exchanger (c).
  Unit sizes 10-20.
  Efficiency up to 90%, depending on operating conditions.

**Versions**
The cross flow heat exchanger (x) is available for Geniox 10-31 in 4 versions with different distances between the plates. This assures numerous options when dimensioning efficiency and pressure drop of the heat exchanger and therefore great flexibility when adjusting the heat exchanger. It is also available in a corrosion protected version.

**By-pass**
The heat exchanger is supplied with a built-in by-pass that can regulate the heat recovery from 0-100%. The by-pass function is comprised of a damper for the heat exchanger and a damper for the by-pass airway. The by-pass function is located in the middle of the plate heat exchanger. Consequently, the heat exchanger is divided.

**De-icing**
If the outdoor air is very cold, usually below -5 °C, there is a risk of frost and ice accumulation in the exhaust air side of the exchanger. By regulating bypass dampers the exchanger can automatically defrost and prevent ice accumulation.

**Drip tray with slope**
A drip tray made of stainless steel or Aluzinc AZ 185. is fitted beneath the heat exchanger for collection of the water that can condense. The drip tray drain outlet must be fitted with two water traps that are designed for the actual pressure difference. Refer to the assembly instructions. Both heat exchangers are fitted with a drip tray with slope in both extract and supply air sections (40 mm outlet).

**Service-friendly**
The heat exchanger is equipped with large inspection doors that provide access for inspection and service. As the heat exchanger has no rotating part, it requires very little service.
Cross flow heat exchanger (x) Counter flow heat exchanger (c)

Air direction variants
Extract air, diagonal downstream
- Supply air
- Exhaust air
- Outdoor air
- Extract air

Cross flow and counter flow heat exchanger
- 1: Cross flow and counter flow heat exchanger
- 2: Cross flow heat exchanger
- 3: Cross flow heat exchanger
- 4: Cross flow heat exchanger

Air direction variants
Extract air, diagonal upstream *
- Supply air
- Exhaust air
- Outdoor air
- Extract air

* Air directions with upstream extract air (3 and 4) should only be used when the moisture content of the extract air, before the heat exchanger, is less than the following values:

<table>
<thead>
<tr>
<th>Supply air before heat exchanger °C</th>
<th>0</th>
<th>-10</th>
<th>-20</th>
<th>-30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extract air before heat exchanger max. g water/kg air</td>
<td>10</td>
<td>8</td>
<td>6</td>
<td>4</td>
</tr>
</tbody>
</table>

Otherwise, there is a risk of water accumulating in the heat exchanger.
Run-around coil heat exchangers

Heat exchanger system using two water coils to transfer via pipe system the cold/heat between extract and supply units.

**Application**
The run-around coil heat exchangers are used where it is a requirement that the two airflows must be kept completely separated, or where they are at a distance from each other. The coils must be connected with a piped circuit in which a water/glycol mixture is circulated. Efficiency ≥ 70%.

**Variants**
- **Standard** – Coil completely built into the unit.
- **MAX** – Full size coil which is wider than the unit. Fins surface corresponds to the inside cross section area of the air handling unit.

**Construction**
The heat exchanger coils consist of copper tubes with aluminium fins.

**Copper tubes**
- **Z** – Copper tubes ø10 mm. Used for lower capacity heat exchangers.
- **Y** – Copper tubes ø15 mm. Used for higher capacity heat exchangers.

**Fins**
- **Al** – Standard aluminium.
- **Alup** – Aluminium with a synthetic coating. Used for mildly corrosive air.

**Drip tray with slope**
In the extract air section a tray for collection of condensed water is standard. In the supply air section it is an option. The tray is available in stainless steel and in Aluzinc AZ 185. The drip tray drain outlet must be fitted with a water trap that is designed for the actual pressure difference (40 mm outlet). Refer to the assembly instructions.

**Droplet eliminator**
The run-around coil heat exchangers are available with a droplet eliminator in the extract air section.

**Piped circuit example**

1. Air vent
2. Manometer
3. Safety valve
4. Feed valve
5. Pressure expansion
6. Thermometer
7. Motorised valve
8. Flow measuring valve
9. Pump

**Regulation**
A motorised valve built into the pipe circuit regulates the heat exchanger capacity.
Heating coil

Air heater

**Heating media**

**W** – Hot water.
Max. temperature 100 °C,
max. working pressure 10 Bar.
Available for temperatures up to
130 °C.

**C** – Condensation of refrigerant.
Max. working pressure depending
on the type of refrigerant.

**E** – Electrical heating.

**Variants**

Standard – Heating coil completely
built into the unit.

MAX – Heating coil which is wider
than the unit, i.e. full-size coil. Hot
water and condensation coils only.

**Construction**

Water coils and condensation coils
are made of copper tubing and
aluminum fins. Coils for electrical
heating consist of stainless steel
tube heating elements.

**Copper tubes**

**Z** – Copper tubes Ø10 mm. Used for
lower capacity heating coils.

**Y** – Copper tubes Ø15 mm. Used for
higher capacity heating coils.

**Fins**

**Al** – Standard aluminium.

Alup – Aluminium with a synthetic
coating. Used for mildly corrosive air.

**Frost protection**

Heating coils for hot water are
available with a connection piece for
the fitting of a temperature sensor
in the water circuit.

**Electrical heating**

The inspection door, which can be
opened only by using a key, provides
access to a terminal box for the
electrical connections. The coil has
a built-in safety thermostat with
an automatic reset function and an
overheating thermostat with manual
resetting.
Cooling coil
Air cooler

Cooling media
W – Cold water.
Max. working pressure 10 Bar.

D – Evaporation.
Max. working pressure depending on the type of refrigerant.

Variants
Standard – Cooling coil completely built into the unit.

MAX – Cooling coil which is wider than the unit, i.e. full-size coil to increase surface area and lower pressure drop. Connection on the outside.

Construction
The water coils are made of copper tubing and aluminum fins.

Copper tubes
Z – Copper tubes ø10 mm.
Used for lower capacity cooling coils.

Y – Copper tubes ø15 mm.
Used for higher capacity cooling coils.

Fins
Al – Standard aluminium.

Alup – Aluminium with a synthetic coating. Used for mildly corrosive air.

Pipe connections
The connection pipes for the cooling coil are placed outside of the air handling unit. The cooling coil for evaporation has the liquid distributor placed inside the unit section. The expansion valve can be fitted to the connection piece outside of the unit.

Drip tray with slope in 3 directions
The cooling coil section is fitted with a stainless steel or Aluzinc AZ 185 drip tray with slope for collection of condensed water. The drip tray drain outlet must be fitted with a water trap that is designed for the actual pressure difference (ø 40 mm outlet). Refer to the assembly instructions.

Droplet eliminator
The cooling coil is available with a droplet eliminator that prevents condensed water droplets from being carried into the airflow.
Change-over coil

Heating of air with hot water/glycol. Cooling of air with cold water/glycol.

**Heating/cooling media**

- **W** – Hot/cold water.
  - Max. working pressure 10 Bar.

**Variants**

- **Standard** – Heating/cooling coil completely built into the unit.
- **MAX** – Heating/cooling coil which is wider than the unit, i.e. full-size coil to increase surface area and lower pressure drop.

**Construction**

Water coils are made of copper tubing and aluminum fins.

**Copper tubes**

- Y – Copper tubes Ø15 mm
- Z – Copper tubes Ø 10 mm.

**Fins**

- **AI** – Standard aluminium.
  - **Alup** – Aluminium with a synthetic coating. Used for mildly corrosive air.

**Pipe connections**

The connection pipes for the cooling coil are placed outside of the air handling unit.

**Drip tray with slope**

The cooling coil section is fitted with a stainless steel or Aluzinc AZ 185 drip tray with slope for collection of condensed water. The drip tray drain outlet must be fitted with a water trap that is designed for the actual pressure difference (Ø40 mm outlet). Refer to the assembly instructions.

**Droplet eliminator**

The change-over coil is available with a droplet eliminator that prevents condensed water droplets from being carried into the airflow.

**Frost protection**

The heating/cooling coil is available with a connection piece for the fitting of a temperature sensor in the water circuit.
Integrated reversible heat pump

The integrated heat pump system is 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 heat pump system can be supplied for Geniox 10 to 24.

Ready for operation at delivery
The integrated heat pump system is supplied as a complete unit that is ready for operation immediately after installation, as it is configured and tested from the factory. The installation is very simple, as the heat pump system is placed between the unit sections and connected to power supply and control signals as well as condensate drain. The integrated heat pump system is equipped with complete control system, which controls the safety functions and capacity regulation. The control system can communicate both with Systemair Access control system and other control solutions.

Construction
The integrated heat pump system is constructed with a 4-way reversing valve so that the system can heat or cool the supply air. Additionally, a rotary heat exchanger is built-in for efficient heat recovery. The combination of heat pump and rotary heat exchanger ensures excellent operating economy in both heating and cooling situations. The integrated heat pump system is equipped with two scroll compressors (1 compressor for Geniox 10 and 11). The capacity is controlled through the modulating digital function on one of the scroll compressors.

Capacity control
The capacity of the integrated heat pump system can be controlled between 5-100% via a 0-10 V DC signal from the air handling unit’s control system. In addition, the control system controls the cooling recovery with the rotary heat exchanger when cooling is required. The outdoor air is cooled by the rotary heat exchanger when the temperature of the extract air is lower than the temperature of the outdoor air. In cooling mode, heat is discharged from the compressor system via the condenser in the exhaust air after the rotary heat exchanger.

Refrigerant
Type R-410A.

Electrical connection
• 3 x 400 V + N + PE.
• Start/stop signal.
• Heating/cooling mode signal.
• 0-10 V DC for capacity control.
• Alarm signal.
• Defrost active signal.

Service-friendly
The integrated heat pump system has a very service-friendly design with easy access to all components inside the large inspection doors.

Drip tray with slope
The stainless steel drip tray with slope must be connected to a water trap with sufficient locking height (ø40 mm outlet).
Cooling and heating capacity, example with Geniox 18 with heat pump

Performance example: Geniox 18 with 2,5 m³/s. Extract 22 °C/35% RH. Defrosting is not taken into account.

Performance example: Geniox 18 with 2,5 m³/s. Extract 23 °C/63% RH.

Cooling capacity

<table>
<thead>
<tr>
<th>Unit size</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>14</th>
<th>16</th>
<th>18</th>
<th>20</th>
<th>22</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended max. airflow m³/s</td>
<td>0,8</td>
<td>1,2</td>
<td>1,6</td>
<td>2,0</td>
<td>2,5</td>
<td>3,0</td>
<td>4,0</td>
<td>4,8</td>
<td>5,3</td>
</tr>
<tr>
<td>Total cooling capacity kW</td>
<td>27</td>
<td>41</td>
<td>55</td>
<td>65</td>
<td>79</td>
<td>102</td>
<td>137</td>
<td>165</td>
<td>181</td>
</tr>
<tr>
<td>Capacity from the cooling circuit kW</td>
<td>12</td>
<td>18</td>
<td>24</td>
<td>29</td>
<td>34</td>
<td>44</td>
<td>59</td>
<td>73</td>
<td>77</td>
</tr>
<tr>
<td>EER, total</td>
<td>7,2</td>
<td>7,1</td>
<td>6,7</td>
<td>6,9</td>
<td>7,1</td>
<td>7,6</td>
<td>8,0</td>
<td>7,5</td>
<td>8,2</td>
</tr>
</tbody>
</table>

Outdoor conditions: 34 °C/45% RH. Supply air: 16 °C. Extract air conditions: 23 °C/63% RH.
**Air humidifier**

Humidifier for adiabatic cooling and humidification.

**Function**
The function is based on the natural process that water evaporates when air passes a wet surface. By uptake of water vapor in the air, the temperature will decrease due to the fact that heat for the evaporation comes from the air. This is an adiabatic cooling, which means that the enthalpy content of the air is unchanged during the process. This ensures that humidification occurs without releasing drops, unless this is affected by entrainment. Entrainment may be avoided by passing the humidification elements with a suitable low speed or by mounting droplet eliminators, which can handle this. The humidifier is VDI 6022 certified.

**Application**
The humidifier can be placed in the supply air after a heating coil which can preheat the air before humidification. Max. air velocity is 5.0 m/s. There may also be a need for an after heating coil in order to achieve the desired supply air temperature. In areas with high outdoor temperature and low humidity, placement of the humidifier in the supply air can be used as adiabatic cooling with great advantage. Indirect adiabatic cooling can be achieved by placing it in the extract air before a plate heat exchanger. It is recommended to use a corrosion-protected heat exchanger.

**Construction**
The humidifier is designed as a complete unit that fits the internal dimensions of Geniox. The unit comprises humidification elements, tray and frame made of stainless steel, circulation pump, balancing valves for irrigation, overflow, valve for adjusting bleed off, float valve for controlling the water supply to the tray and valve for emptying the tray. Droplet eliminator is included if necessary and sensor for protection of pump at low water level. The drain is led out of the section, and can be selected either on the inspection side or the backside. The drain must be connected to a water trap with sufficient locking height. The humidifier can be step-controlled as illustrated on the next page.

**Humidification elements**
HU-CELL humidification elements are stainless steel frames which contain corrugated fiberglass plates arranged in cross-channel configuration. The corrugated cross-channel configuration ensures that the air is in contact with a large surface area for evaporation, and at the same time provides a low pressure drop.

The glass fiber material is impregnated with a stabilizing and absorbent additive which makes it possible to absorb water without loss of stability. The element is of inorganic material, and is therefore not a feed source for bacteria and mould. The material contains silver ions, which act as a growth inhibitor. This increases the resistance to the growth of microorganisms and helps to release deposits from the water on the material, so that this remains clean. Silver ions are encapsulated in a chemical mixture, which ensures that their particles do not dissolve to either water or air.

The elements are supplied in the following thicknesses 75 mm, 100 mm, 125 mm, and 150 mm. This makes it possible to optimize the pressure drop depending on the desired humidification/cooling requirement.

Control system is not supplied.
Operating principles
HEF2E (Recirculated water, standard on/off)

- A. Process air
- B. Humidified air
- C. Water supply
- D. Overflow
- E. Constant bleed off
- F. Drainage
- G. Water outlet to drain
- 1. Humidification element
- 2. Droplet eliminator (optional)
- 3. Water recirculations pump
- 4. Bleed off regulation valve
- 5. Irrigation regulation valves
- 6. Float valve
- 7. Draining valve
- 8. Filling solenoid valve (optional)
- 9. Max/min water level detector
- 10. Cut-off valve (depending on model)

<table>
<thead>
<tr>
<th>Unit size</th>
<th>Number of stage valves/solenoid coil</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
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<td>29</td>
<td>5</td>
</tr>
<tr>
<td>31</td>
<td>5</td>
</tr>
</tbody>
</table>

There are always 1 valve/solenoid coil supply water and 1 motor drain valves/solenoid coil 24 V as standard and 230 V as an option for both.
Panel filter
Prefilter

Filter classification
Coarse 65% (G4) according to EN ISO 16890.

Filter material
Synthetic polyester fibres.

Filter surface area
Large surface area due to the pleated filter form.

Filter frame
Framework encasing the filter with U-profiles of aluzinc.

Accessories
- U-tube manometer
- Magnehelic manometer
- Pressure outlet tab
- Spare filter
- Filter guard (on/off).

<table>
<thead>
<tr>
<th>Unit size</th>
<th>Number and size</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>1x[792x392x48]</td>
</tr>
<tr>
<td>11</td>
<td>2x[490x392x48]</td>
</tr>
<tr>
<td>12</td>
<td>1x[490x490x48] + 1x[592x490x48]</td>
</tr>
<tr>
<td>14</td>
<td>2x[490x592x48] + 1x[287x592x48]</td>
</tr>
<tr>
<td>16</td>
<td>3x[490x592x48]</td>
</tr>
<tr>
<td>18</td>
<td>2x[490x392x48] + 4x[592x392x48]</td>
</tr>
<tr>
<td>20</td>
<td>3x[592x592x48] + 5x[592x287x48]</td>
</tr>
<tr>
<td>22</td>
<td>6x[592x490x48] + 2x[287x490x48]</td>
</tr>
<tr>
<td>24</td>
<td>3x[592x592x48] + 4x[490x592x48] + 1x[490x490x48]</td>
</tr>
<tr>
<td>27</td>
<td>2x[592x592x48] + 8x[490x592x48]</td>
</tr>
<tr>
<td>29</td>
<td>6x[592x592x48] + 4x[490x592x48]</td>
</tr>
<tr>
<td>31</td>
<td>5x[592x592x48] + 5x[592x490x48] + 5x[592x287x48]</td>
</tr>
</tbody>
</table>
**Bag filter**

Prefilter, medium or fine filter.

**Filter classification**

Coarse 65% (G4), ePM10 60% (M5), ePM2.5 50% (M6), ePM1 60% (F7), ePM1 70% (F8), ePM1 85% (F9) or CITY-FLO ePM1 60% (F7 City-Flo) according to EN ISO 16890.

**Filter material**

- Coarse 65% (G4): Synthetic material.
- ePM10 60% (M5), ePM2.5 50% (M6), ePM1 60% (F7), ePM1 70% (F8), ePM1 85% (F9): Glass fibre material.
- CITY-FLO ePM1 60% (F7 City-Flo): Glass fibre and coal with a wide spectrum.

- ePM1 60% (F7), ePM1 70% (F8), ePM1 85% (F9) are available in two lengths; 520 and 640 mm.

**Unit size**

<table>
<thead>
<tr>
<th>Unit size</th>
<th>Number and size of frames</th>
<th>Coarse 65% L = 370 mm</th>
<th>ePM10 60% L = 520 mm</th>
<th>ePM2.5 50% L = 520 mm</th>
<th>ePM1 60%, 70% and 85% L = 520 mm</th>
<th>ePM1 60%, 70% and 85% L = 640 mm</th>
<th>CITY-FLO ePM1 60% L = 520 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
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<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>11</td>
<td>2x[490x392]</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>12</td>
<td>1x[490x490] + 1x[592x490]</td>
<td>8+6</td>
<td>8+8</td>
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<td>8+8</td>
<td>8+8</td>
<td>8+8</td>
</tr>
<tr>
<td>14</td>
<td>2x[490x592] + 1x[287x592]</td>
<td>5+8</td>
<td>5+5</td>
<td>8+5</td>
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<tr>
<td>16</td>
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<td>5</td>
<td>5</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>18</td>
<td>2x[490x392] + 4x[592x392]</td>
<td>8+10</td>
<td>8+10</td>
<td>8+10</td>
<td>8+10</td>
<td>8+10</td>
<td>8+10</td>
</tr>
<tr>
<td>20</td>
<td>3x[592x592] + 3x[592x287]</td>
<td>6+6</td>
<td>6+6</td>
<td>10+10</td>
<td>10+10</td>
<td>10+10</td>
<td>10+10</td>
</tr>
<tr>
<td>22</td>
<td>6x[592x490] + 2x[287x490]</td>
<td>6+5</td>
<td>6+5</td>
<td>10+5</td>
<td>10+5</td>
<td>10+5</td>
<td>10+5</td>
</tr>
<tr>
<td>24</td>
<td>3x[592x592] + 1x[490x592]</td>
<td>6+5+6+8</td>
<td>6+5+6+8</td>
<td>10+8+10+8</td>
<td>10+8+10+8</td>
<td>10+8+10+8</td>
<td>10+8+10+8</td>
</tr>
<tr>
<td>27</td>
<td>2x[592x592] + 8x[490x592]</td>
<td>6+5</td>
<td>6+5</td>
<td>10+8</td>
<td>10+8</td>
<td>10+8</td>
<td>10+8</td>
</tr>
<tr>
<td>29</td>
<td>6x[592x592] + 4x[490x592]</td>
<td>6+5</td>
<td>6+5</td>
<td>10+8</td>
<td>10+8</td>
<td>10+8</td>
<td>10+8</td>
</tr>
<tr>
<td>31</td>
<td>5x[592x592] + 5x[592x490] + 5x[592x287]</td>
<td>6+6+6</td>
<td>6+6+6</td>
<td>10+10+10</td>
<td>10+10+10</td>
<td>10+10+10</td>
<td>10+10+10</td>
</tr>
</tbody>
</table>

**Filter frame**

The filter cells are supplied with 25 mm standard plastic frame. Therefore, used filters can be disposed of in their entirety by combustion.

**Sealing**

Rubber sealing strips are fixed to the filter cells. Air tightness according to EN 1886:2008.

**Fitting the filter cells**

The cells are sealed with the enclosed sealing strips from Camfil. They are mounted on the filter profile (filter profile by ABS and TPE) with ease in a sliding movement.

**Positioning of an ePM1 85% (F9) filter**

The class ePM1 85% (F9) filter should always be positioned in the positive pressure side of the supply air unit (EN 1886:2008).

**Accessories**

- U-tube manometer
- Inclined tube manometer
- Magnehelic manometer
- Pressure outlet tab
- Stainless steel bottom plate
- Spare filter set
- Inspection window
- LED-light with external switch.
Metal filter

Prefilter

**Filter class**  
G2 according to EN ISO 16890.

**Filter material**  
The filter cells are made from electro-galvanised aluminium thread that is weaved together.

**Filter area**  
Very large surface, without additional air resistance.

**Filter frame**  
Stainless steel.

**Application**  
The metal filter is used as a prefilter in the extract air, where there may be grease particles in the air. However, there should always be a grease filter in the cooker hood. The metal filter is also efficient as a prefilter where there is dust, sand, flour, paint or oil in the outdoor air.

**Cleaning**  
Washable.

**Accessories**  
- U-tube manometer
- Magnehelic manometer
- Stainless steel base
- Filter guard (on/off)
- Spare filter
- LED light with external switch.

<table>
<thead>
<tr>
<th>Unit size</th>
<th>Number and size</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>1x[792x392x40]</td>
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<tr>
<td>11</td>
<td>2x[490x392x40]</td>
</tr>
<tr>
<td>12</td>
<td>1x[490x490x40] + 1x[392x490x40]</td>
</tr>
<tr>
<td>14</td>
<td>2x[490x592x40] + 1x[287x592x40]</td>
</tr>
<tr>
<td>16</td>
<td>3x[490x592x40]</td>
</tr>
<tr>
<td>18</td>
<td>2x[490x392x40] + 4x[392x392x40]</td>
</tr>
<tr>
<td>20</td>
<td>3x[592x592x40] + 3x[592x287x40]</td>
</tr>
<tr>
<td>22</td>
<td>6x[592x490x40] + 2x[287x490x40]</td>
</tr>
<tr>
<td>24</td>
<td>3x[592x592x40] + 4x[490x592x40] + 1x[490x490x40]</td>
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<tr>
<td>27</td>
<td>2x[592x592x40] + 8x[490x592x40]</td>
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<tr>
<td>29</td>
<td>6x[592x592x40] + 4x[490x592x40]</td>
</tr>
<tr>
<td>31</td>
<td>5x[592x592x40] + 5x[592x490x40] + 5x[592x287x40]</td>
</tr>
</tbody>
</table>
Carbon filter
Supply air, recirculation, or exhaust filter.

**Filtermaterial**
- Carbon type CEX003 in a cylindrical cartridge.
- Length 450 mm.
  Max. air flow 1,120 m$^3$/h, 135 Pa.
- The air flow and pressure are applicable for 16 cylinders on a 610 x 610 mm bottom plate.

**Filter cartridge**
Cartridge frame in solid cast plastic.

**Application**
A molecular filter for high efficiency and long term control of molecular pollution in sensitive buildings and the processing industry. The carbon filter is effective against airborne molecules, such as odours, Volatile Organic Components (VOCs), toxic gasses, and corroding elements. The filter can also be used as a recirculation or exhaust filter.

**Limit values**
Temperature: -20 - +60 °C
Humidity: RH max. 70%
Recommended contact time: Min. 0.2 sec. (calculated in SystemairCAD).

**Placement**
The carbon filter is typically placed as a prefilter in the supply air. To ensure that the filter does not get dirty, you should always place an ePM1 60% (F7) filter in front of the carbon filter.

**Accessories**
- Spare filter
- Inspection window
- LED light with external switch.

<table>
<thead>
<tr>
<th>Unit size</th>
<th>Type</th>
<th>Number of cartridges</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>F 10 Carbon (CamCarb Green CG 2600-CEX003)</td>
<td>10</td>
</tr>
<tr>
<td>11</td>
<td>F 11 Carbon (CamCarb Green CG 2600-CEX003)</td>
<td>18</td>
</tr>
<tr>
<td>12</td>
<td>F 12 Carbon (CamCarb Green CG 2600-CEX003)</td>
<td>21</td>
</tr>
<tr>
<td>14</td>
<td>F 14 Carbon (CamCarb Green CG 2600-CEX003)</td>
<td>32</td>
</tr>
<tr>
<td>16</td>
<td>F 16 Carbon (CamCarb Green CG 2600-CEX003)</td>
<td>36</td>
</tr>
<tr>
<td>18</td>
<td>F 18 Carbon (CamCarb Green CG 2600-CEX003)</td>
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<tr>
<td>20</td>
<td>F 20 Carbon (CamCarb Green CG 2600-CEX003)</td>
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</tr>
<tr>
<td>22</td>
<td>F 22 Carbon (CamCarb Green CG 2600-CEX003)</td>
<td>84</td>
</tr>
<tr>
<td>24</td>
<td>F 24 Carbon (CamCarb Green CG 2600-CEX003)</td>
<td>98</td>
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<tr>
<td>27</td>
<td>F 27 Carbon (CamCarb Green CG 2600-CEX003)</td>
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<td>29</td>
<td>F 29 Carbon (CamCarb Green CG 2600-CEX003)</td>
<td>136</td>
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<tr>
<td>31</td>
<td>F 31 Carbon (CamCarb Green CG 2600-CEX003)</td>
<td>162</td>
</tr>
</tbody>
</table>
**Damper**

The dampers can be used as shut-off dampers for intake, extract, exhaust, and outdoor air. The dampers can also be used for mixing and recirculation.

---

**Air tightness classification**
- Class 4 (leakage through a closed damper).
- Class C (casing leakage).

**Damper blades**
Aerodynamically formed aluminium profiles. Can be supplied as an insulated option.

**Bearings**
Synthetic bearings with large bearing surfaces.

**Sealing**
Rubber sealing strips between the damper blades. Special sealing between frame and damper blades.

**Blade pivoting system**
Composite gears combined with steel rods.

**Blade position indicator**
Arrow for indication of the blade position.

**Damper motor**
The dampers are activated by a motor for each damper.

**Motor bracket**
Bracket for fixing of a damper motor for each damper.

**Damper types**
There are four types of dampers for each unit size. The dampers can be placed in end, top, or back of the unit and between airflows, allowing high flexibility.

<table>
<thead>
<tr>
<th>Damper type</th>
<th>Internal in unit</th>
<th>External on unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Full face, back of unit. Geniox 10-20 one damper motor.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Half face, back of unit. Geniox 10-31 one damper motor.</td>
<td></td>
</tr>
</tbody>
</table>

**Shafts**
12 mm steel
### Dampers external on unit – Duct connection sizes, 20 mm flange connection

<table>
<thead>
<tr>
<th>Damper type</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>14</th>
<th>16</th>
<th>18</th>
<th>20</th>
<th>22</th>
<th>24</th>
<th>27</th>
<th>29</th>
<th>31</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>750</td>
<td>850</td>
<td>950</td>
<td>1150</td>
<td>1350</td>
<td>1550</td>
<td>1750</td>
<td>1950</td>
<td>2150</td>
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<td>-</td>
<td>-</td>
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<tr>
<td>H</td>
<td>400</td>
<td>400</td>
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<td>900</td>
<td>1000</td>
<td>1100</td>
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<table>
<thead>
<tr>
<th>Damper type</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<tbody>
<tr>
<td>W</td>
<td>750</td>
<td>850</td>
<td>950</td>
</tr>
<tr>
<td>H</td>
<td>200</td>
<td>200</td>
<td>300</td>
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### Dampers internal in unit – Duct connection sizes

<table>
<thead>
<tr>
<th>Damper type</th>
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<th>12</th>
<th>14</th>
<th>16</th>
<th>18</th>
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<tbody>
<tr>
<td>W</td>
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<td>2000</td>
<td>2200</td>
<td>2400</td>
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<td>3100</td>
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<tr>
<td>H</td>
<td>400</td>
<td>450</td>
<td>500</td>
<td>600</td>
<td>700</td>
<td>800</td>
<td>900</td>
<td>1000</td>
<td>1100</td>
<td>1200</td>
<td>1300</td>
<td>1400</td>
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### Required torque (Nm) for each damper motor with varying pressure drops

<table>
<thead>
<tr>
<th>Pressure drop</th>
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<th>12</th>
<th>14</th>
<th>16</th>
<th>18</th>
<th>20</th>
<th>22</th>
<th>24</th>
<th>27</th>
<th>29</th>
<th>31</th>
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<tbody>
<tr>
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<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
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<td>17</td>
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<tr>
<td>500 Pa</td>
<td>7</td>
<td>8</td>
<td>10</td>
<td>11</td>
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<td>14</td>
<td>16</td>
<td>17</td>
<td>19</td>
<td>21</td>
<td>23</td>
<td>24</td>
</tr>
<tr>
<td>1000 Pa</td>
<td>9</td>
<td>11</td>
<td>13</td>
<td>15</td>
<td>17</td>
<td>19</td>
<td>20</td>
<td>22</td>
<td>24</td>
<td>26</td>
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<td>29</td>
</tr>
</tbody>
</table>
Sound attenuator

The sound attenuator is used to reduce the sound power level from the air handling unit to the duct system.

**Construction**
The sound attenuator is an absorption attenuator with baffles made of rockwool. The baffles are surface treated in order to prevent the absorption material fibres from being carried away. Is also available for installation on duct.

**Variants**
2. Baffles with standard lining for dry cleaning. The air handling unit casing has large inspection doors for easy cleaning.
3. Baffles with a synthetic lining, ideal for wet cleaning. Each baffle is enclosed in a stainless steel frame. The air handling unit casing has large inspection doors for easy cleaning.

<table>
<thead>
<tr>
<th>Attenuation dB</th>
<th>63</th>
<th>125</th>
<th>250</th>
<th>500</th>
<th>1000</th>
<th>2000</th>
<th>4000</th>
<th>8000</th>
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</thead>
<tbody>
<tr>
<td>Geniox, length 600</td>
<td>3</td>
<td>7</td>
<td>11</td>
<td>18</td>
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<td>32</td>
<td>29</td>
<td>20</td>
</tr>
<tr>
<td>Geniox, length 900</td>
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<td>11</td>
<td>17</td>
<td>25</td>
<td>36</td>
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<td>36</td>
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</tr>
<tr>
<td>Geniox, length 1200</td>
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<td>15</td>
<td>23</td>
<td>32</td>
<td>43</td>
<td>46</td>
<td>43</td>
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<tr>
<td>Geniox, length 1500</td>
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<td>19</td>
<td>29</td>
<td>39</td>
<td>50</td>
<td>53</td>
<td>50</td>
<td>44</td>
</tr>
<tr>
<td>Geniox, length 1800</td>
<td>11</td>
<td>23</td>
<td>35</td>
<td>46</td>
<td>57</td>
<td>60</td>
<td>57</td>
<td>52</td>
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</tbody>
</table>
Inspection section

The inspection section is used where the option of service, inspection, or measuring is required, before or after an air handling function.

<table>
<thead>
<tr>
<th><strong>Construction</strong></th>
<th><strong>Accessories</strong></th>
</tr>
</thead>
</table>
| The inspection section consists of an empty unit casing with an inspection door. | - Inspection window fitted into the inspection door.  
- LED lamp with external switch.  
- Pressure outlet tab. |
Empty section

Used in units where space is required to fit a component, e.g. a temperature sensor, or to have the option of applying an extra air handling function at a later date.

**Construction**
The empty section consists of an empty unit casing, where the side panels are assembled with screws.

**Accessories**
- Inspection window fitted into the inspection door
- LED lamp with external switch.
**Outdoor air section**

The outdoor air section is used for air intake and outlet in roof units.

**Function**
The outdoor air section has air intake through the end of the unit, and outlet of exhaust air through the back wall of the unit.

**Construction**
The outdoor air section consists of an air handling unit casing with inspection door. The openings for air intake and outlet have louvers for effective protection against rain and snow. The outdoor air section can be delivered pre-painted.

**Dimensions**

<table>
<thead>
<tr>
<th>Unit size</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>14</th>
<th>16</th>
<th>18</th>
<th>20</th>
<th>22</th>
<th>24</th>
<th>27</th>
<th>29</th>
<th>31</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width W</td>
<td>1082</td>
<td>1182</td>
<td>1282</td>
<td>1482</td>
<td>1682</td>
<td>1882</td>
<td>2082</td>
<td>2282</td>
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<td>2782</td>
<td>2982</td>
<td>3182</td>
</tr>
<tr>
<td>Height H</td>
<td>1082</td>
<td>1182</td>
<td>1282</td>
<td>1482</td>
<td>1682</td>
<td>1882</td>
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<td>2282</td>
<td>2482</td>
<td>2764</td>
<td>2964</td>
<td>3164</td>
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<tr>
<td>Length L</td>
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<td>600</td>
<td>800</td>
<td>900</td>
<td>1000</td>
<td>1100</td>
<td>1200</td>
<td>1300</td>
<td>1400</td>
<td>1500</td>
<td>1700</td>
<td>1900</td>
</tr>
</tbody>
</table>
Supporting legs

Units in sizes Geniox 10-18 for indoor installation can be supplied with supporting legs.

**Construction**
Supporting legs are made of Magnelis ZM310. Pre-painting in RAL 7024 of the supporting legs is an option. They are 118 mm high, and have feet which are adjustable from 30-55 mm.
Standard base frame

Units for indoor installation can be supplied with base frame in height 118 mm with ø 50 mm holes or 218 mm with ø 80 mm holes. The base frame has feet which are adjustable from 30-55 mm.

Minimum length of base frame is 400 mm. Maximum length of the base frame is 6000 mm for units Geniox 10-24 and 4600 mm for units Geniox 27-31. Longer units are supplied divided on two or more base frames. The base frame is self-supporting, but as a minimum it must be supported in each corner and on the longitudinal profiles for each 1500 mm.

Construction

The base frame consists of strong, galvanized steel profiles, 118 mm or 218 mm height assembled with bolts. The unit can be delivered installed on the base frame from factory, or the base frame can be delivered separately. Pre-painting in RAL 7024 of the base frame is an option.

Base frame with high legs

It is possible to choose additional high legs for base frames. These legs will always be 250 mm high and they will be delivered with feet which can be adjusted 120 mm. This facilitates easy access for cleaning under the unit. The length and width of the unit determines the number of legs needed. Pre-painting is an option for the base frame as well as for the high legs.

Geniox air handling units for outdoor installation

Geniox air handling units for outdoor installation are always supplied with 218 mm base frame with ø 80 mm holes. As extra protection against corrosion, base frames for outdoor installation can be supplied pre-painted. The unit will always be installed on the base frame when delivered.

Standard base frame in a pre-painted version

Base frame with high legs

Standard base frame

Geniox air handling units for outdoor installation
Base frame with forklift holes

Geniox air handling units for indoor installation
In order to save time on the building site it is an option to choose a unit delivered on a base frame with forklift holes. This is an option for Geniox sizes 10-31 (not applicable for units with heat pumps).

Construction
The height of the base frame is always 118 mm. Minimum length of section is 700 mm in order to ensure enough space for the forklift holes. The unit will always be installed on the base frame when delivered, and the base frame will be adjusted to the lengths of the unit sections, max. 2882 mm. The base frame is made of 3 mm galvanized steel sheets. The base frame can be delivered pre-painted, RAL 7024.
Assembly brackets
The assembly bracket is designed to ensure an airtight connection between the casing sections.

Assembly brackets
For air handling units divided in sections, the assembly brackets are mounted externally. Screws and nuts are delivered separately. For air handling units mounted on a base frame and assembled in the factory, the assembly brackets are mounted inside the unit. The brackets ensure that the sections are aligned at the end of the assembly.

Construction
The brackets are made of zinc and pre-painted in dark grey.
Duct connection part

The connection part is used when connecting duct work to the Geniox air handling unit, either as rigid connection or as rigid and flexible connection.

Variants
End of unit.
Top half face.
Top full face.
Back of unit.

Dimensions

<table>
<thead>
<tr>
<th>Unit size</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>14</th>
<th>16</th>
<th>18</th>
<th>20</th>
<th>22</th>
<th>24</th>
<th>27</th>
<th>29</th>
<th>31</th>
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</thead>
<tbody>
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<td>Top half face</td>
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<td>Top full face</td>
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<td>1400</td>
</tr>
</tbody>
</table>
Duct connection part

Rigid connection part for connecting to 20 mm LS profile for C-rail, and for 20 mm EP/LSM profile with holes in the corners.

Flexible connection part for connecting to 20 mm LS profile for C-rail. For mounting in continuation of rigid connection part.

Rigid connection part for connecting to 30 mm EP/LSM profile with holes in the corners.

Flexible connection part for connecting to 30 mm EP/LSM profile with holes in the corners. For mounting in continuation of rigid connection part.