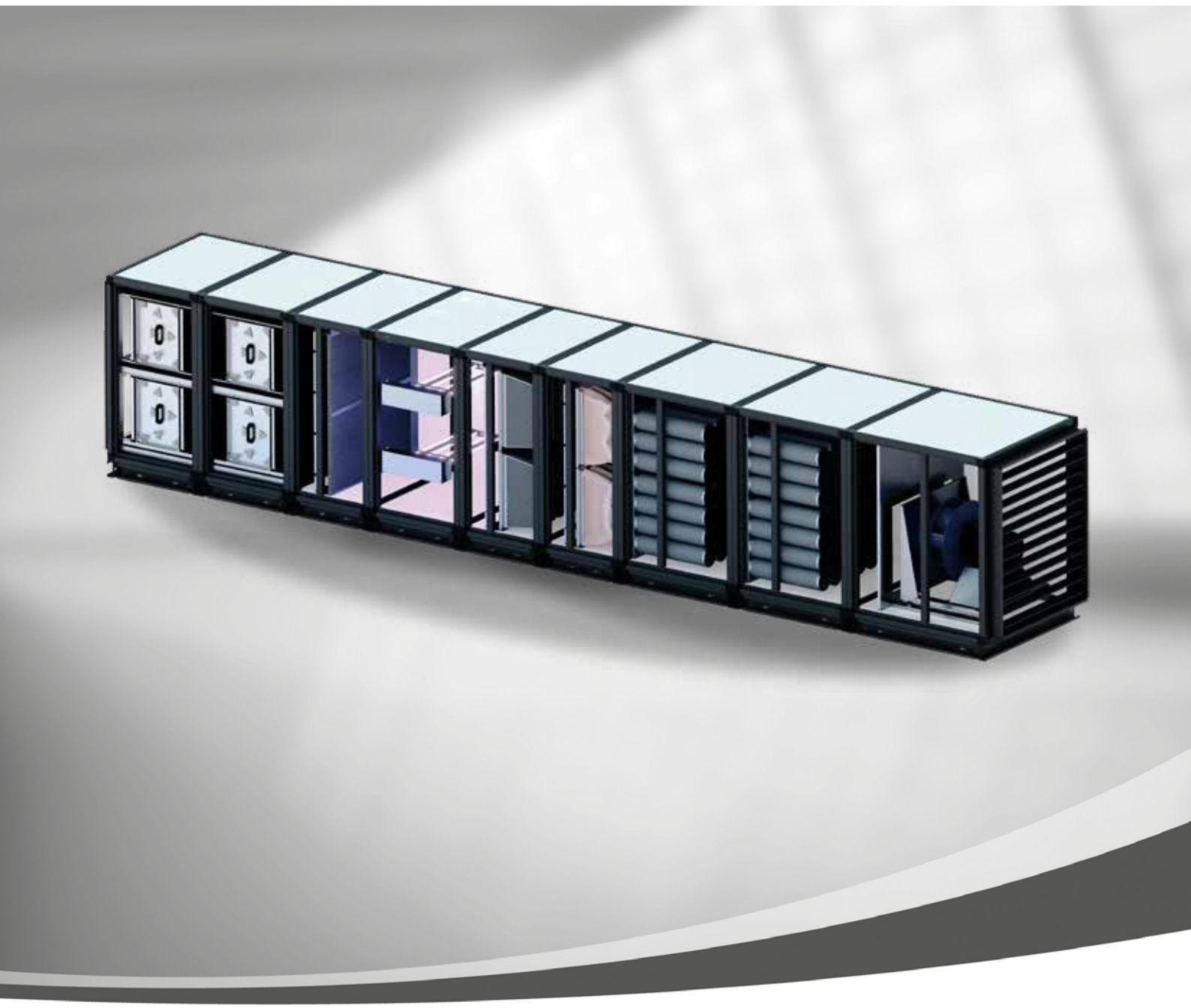
Geniox VOClean Ecology Units

User Manual



geniox

systemair

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A Manufacturer

This User Manual covers all ecology units delivered by Systemair Turkey.

Manufacturer and supplier data:
Systemair Turkey
Makina Organize Sanayi Bölgesi
41455Demirciler OSB Dilovası / Kocaeli
Responsible for documentation: Ozge Sengoz

B Name of machines

This manual is about Systemair Ecology Units called Geniox VOClean 07.07, Geniox VOClean 11.07, Geniox VOClean 15.08, Geniox VOClean 11.13, Geniox VOClean 16.13, Geniox VOClean 20.13, Geniox VOClean 16.19, Geniox VOClean 20.19, Geniox VOClean 25.19.

C Declaration of Conformity - Example

The manufacturer:
Systemair Turkey
41455 Demirciler OSB
Dilovası / Kocaeli

Hereby declares that, Ecology Units of the following types:

Geniox VOClean 07.07, Geniox VOClean 11.07, Geniox VOClean 15.08, Geniox VOClean 11.13, Geniox VOClean 16.13, Geniox VOClean 20.13, Geniox VOClean 16.19, Geniox VOClean 20.19, Geniox VOClean 25.19 are manufactured and delivered in accordance with following directives:

Machinery directive 2006/42/EC
Ecodesign - Commission regulation 1253/2014
EMC- directive 2014/30/EC
Low voltage directive 2014/35/EC
European Standard EN ISO 12100:2010, EN 60204-1: 2018, EN 61000-6-2:2005, EN 61000-6-4:2007

Equipment type: **Geniox VOClean**
Notified SGS Supervise Gözetme Etüd Kontrol Servisleri AS.
Bağlar Mah. Osmanpasa Cad. No:95 Istanbul Certificate no:
CE-19423343/IST/19

The declaration is only valid, if the installation of the ecology units is carried out according to the instructions delivered with the unit. The installer will be responsible for the CE marking and documentation, if any construction or functional changes are applied to the ecology unit.

Turkey, 16 June 2019

CE

D General descriptions, dangers and warnings

Geniox VOClean Ecology Units are intended for the transport and treatment of air between -40 °C and + 40 °C.
The units are exclusively for kitchen exhaust filtration systems.
Maintenance of the units must be carried out by skilled technicians.

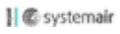
D.1 Overview via pictograms on the inspection side of the unit

Figure 1. Pictograms on Unit

D.1.1 Where are pictograms placed on the units

Example (Pictograms and labels with descriptions of functions for fast identification)

Position	Description	Symbol
1	Warning about danger by electricity	
2	EPA/HEPA and Bag Filter	
3	Active Carbon Filter	
4	Fan (Front Intake/Discharge)	
5	Warning about danger by rotating fan during 4 minutes rundown period	
6	Duct Connection	

Position	Description	Symbol
7	Damper	
8	Machine card	
9	Branding	
10	The Section Where Crane Lifting is Prohibited	
11	Crane Lifting Section	
12	Grounding	
13	ESP Warning	
14	Electrostatic Precipitator	
	Warning about crushing	
	Connect sections with identical numbers	
	UVV	
	Silencer	
	Control (Automation) Panel	

D.1.2 CE label - example for the Geniox Ecology unit

CE marking is printed on the machine card.

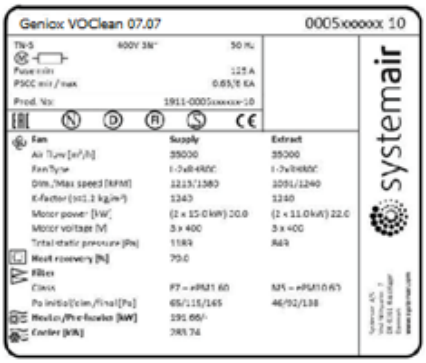


Figure 2. Labelling

D.2 Data about the unit according to cards and labels in and on the unit

D.2.1 Example of Machine card with unique data on every unit

The unique production number for the complete unit in this example is 1911-0005xxxxxx-10 where 19 indicates production year 2019 and 11 indicates production month at the Systemair factory in Turkey. With question about the unit please inform staff at Systemair of this unique production number from the factory in Turkey.

If the unit is not at a site in Turkey but at a site in any other country, please inform the staff at your local Systemair company of this unique production number from the factory in Turkey and please inform of the original order confirmation number from the Systemair company in your country with questions to your local Systemair company in your country. If the order confirmation number is not available, please inform that staff at the local Systemair company that detailed information about the unit through the above mentioned production number from the factory in Turkey is immediately available for Systemair staff from **www.systemair.com.tr** through a personal password for each Systemair employee.

D.2.2 Label with data about the cabinet- example

An example of the label that is always placed on or with the cabinet

Systemair Turkey	
Systemair declares hereby that the cabinet is in conformity with:	
SBB Low voltage panels:	N60439-1
Electrical material on machines:	EN60204-1
EMC-directive environment:	89/336/EOF
Diagram version	Geniox ver. X:XX
Systemair order number	72800-1
Unit size	10
Cabinet data:	
System ground	TN-S
Current type	AC
Frequency	50 HZ
Rated voltage	3*400 V+N+PE VAC
Control voltage	24 VDC
Protection circuit	Green/yellow
230 VAC phase	Brown
0 VAC neutral	Blue
24 VDC	Brown
0 VDC	White
Analog/digital	Green

Table 1. Cabinet Label

E Drawings, diagrams, guides and instructions for the use, maintenance and repair

All units are manufactured in compliance with the EC Declaration of Conformity and they are CE marked as machines. If the buyer carries out changes or adds components in or on the machine, the buyer must issue a new EC Declaration of Conformity and a new CE marking of the machine.

To promote correct use of the machines, the below-mentioned instructions are an integral part of the machine:

- Instructions for use of the machine
- Instructions about adjustment and maintenance
- Safety during adjustment and maintenance
- Wiring diagram, if the unit is delivered with control system.
- Operator's Guide (also called User's Guide), if the unit is delivered with control system.

F Employees in charge of operation/control/maintenance

The units are constructed and built with a fully integrated control system. After start-up and hand-over from installer to operators/users, the unit operates fully automatically.

Indications of operating status as well as indication of faults are visible in the display at the hand terminal. The operators/users can enter new parameters in the controller via the hand terminal. Alternatively, the controller can be connected to a BMS system so that new parameters can be selected via PC, tablet or Smartphone. The operators/users do not need to open inspections doors for the operation.

Skilled technicians must carry care out maintenance as well as repairs.

G Ecology unit in operation

Before start-up of the unit all ducts, safety guards and all protective devices must be mounted to prevent any access to rotating fan impellers. All inspection doors must be closed and locked when the unit is in operation.

Do not use the unit without filters.

H Instructions for unloading on the site as well as installation and connection

H.1 Unloading on the site

The Ecology Unit - is delivered as one section or in several sections, which are to be assembled on site. The Ecology unit is delivered on transport pallets, legs, base frame with brackets for lifting or base frames with holes for forks on forklifts. Loading and unloading as well as transport on the site is possible by fork-lift truck or by crane using suitable lifting straps.

H.1.1 Handling methods

Possible (✓) and not possible (X) handling methods are described in the table below.

Type	Handling Methods					
	Forklift	Lifting by straps	Brackets at base frame for lifting	Hoist holes in base frames	Holes in base frames for forks (option)	Corners in sections for lifting
Sections on pallets	✓	✓	X	X	X	✓
Sections on base frames	✓	✓	✓	✓	✓	✓
Unit on base frame	✓	✓	✓	✓	✓	X

Table 2. Handling Methods

H.1.2 Unloading by fork-lift truck

The forks of the truck must be sufficiently long to avoid any damage to the AHU underside.

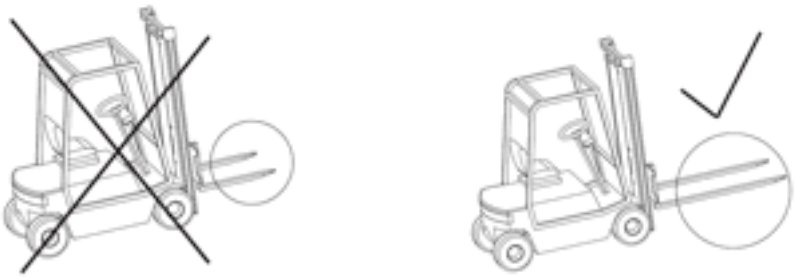


Figure 3. Unloading by Fork-lift

H.1.3 Unloading by crane

AHU delivered on transport pallet must be lifted by straps as shown in the illustration.

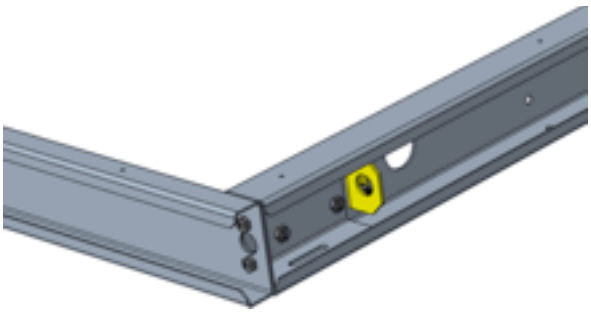


Figure 4. Bracket

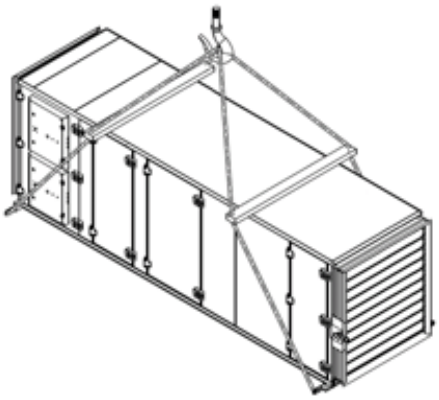


Figure 5. Lifting by Ropes

H.1.4 Transport of unit without base frame on the site

Units without base frame are always delivered in sections with each section on a pallet. Sections can be transported on the site by hand manual forklifts.

H.1.5 Lifting a unit with straps

Use an appropriate lifting beam with a sufficient span to avoid that the straps touch and damage the drip nose profiles and the inspection side with handles, pipes and accessories-for example manometers, cabinets, tabs for measuring pressure.

H.1.6 Lifting a unit with installed brackets on the base frame for lifting

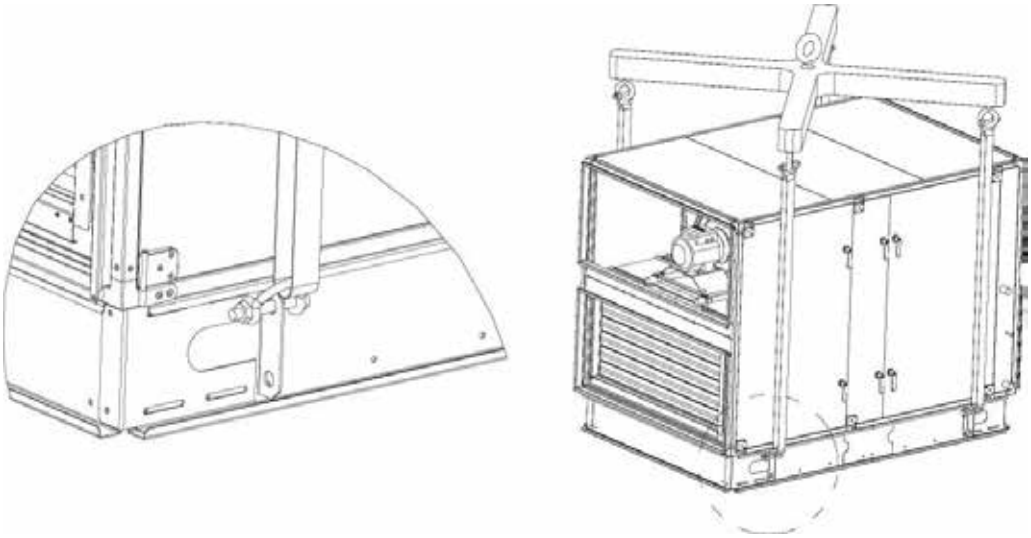


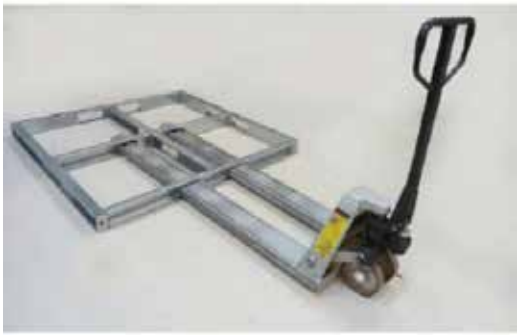
Figure 6 . Lifting from Base Frame

Lifting beam and straps are not included in the delivery.

The information about the weight of a section is very accurate and you must always be sure that the equipment intended for lifting the section is constructed and authorized for the task.

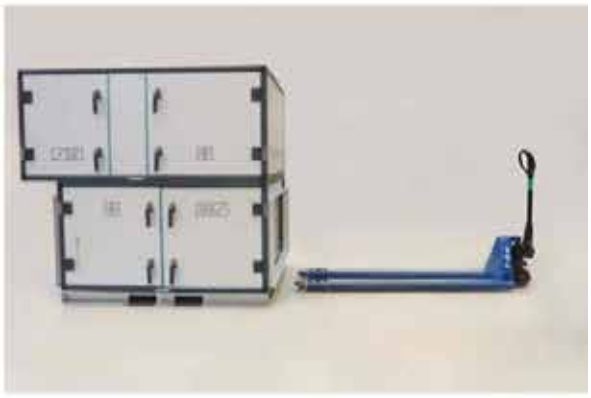
H.1.8 Handling a unit with holes in base frame for forks

Depending on the width or length of the section/unit there will be 1, 2 or more middle profiles.



Do not activate the wheels of forklift on the horizontal profile of a middle profile. Activation of the wheels on the horizontal profile might bend the profile.

The forks of the forklift must be longer than the width or length of the section/unit to achieve safe transport of the section/unit.



Very important to check that the wheels of the forklift are never activated on the horizontal profile of the base frame on the other side of the section/unit.

If only forklifts for Europallets with forks that are only 120 cm long are available, the alternative is to use 2 of those forklifts.

By lifting the section/unit with 2 or more forklifts it is important to avoid activation of wheels of any forklift on any horizontal profile the base frame.

Figure 7. Lifting with Pallet Truck

H.1.9 Roof unit with PVC

Avoid damaging the drip nose profiles along the PVC. Keep the protection profiles of Styrofoam on the unit until the installation has been completed. If the unit is lifted by straps, the straps must be kept away from the drip nose profiles by bars to avoid damage to roofing profiles.

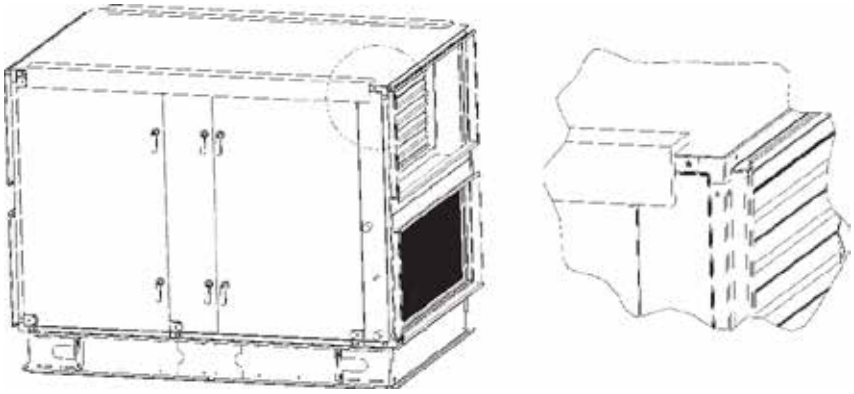


Figure 8. PVC Roof

H.1.10 Pre-assembly storage

The Ecology uint must be protected from the weather and accidental impact. Plastic packaging must be removed and the unit covered with tarpaulin or similar materials. In order to minimize condensation, sufficient air circulation must be ensured between the covering and the unit.

H.2 Installation - mechanical

H.2.1 Free area in front of and above the unit

IMPORTANT
When positioning the unit on the site, it must be ensured that an area with the same width as the unit is kept free for service and inspection and also for replacement of fans and exchanger, if needed. The width of the free area must be at least 900 mm.

IMPORTANT
For safe access to the cabinet with electrical components, if the cabinet is 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.

H.2.2 Supporting surface

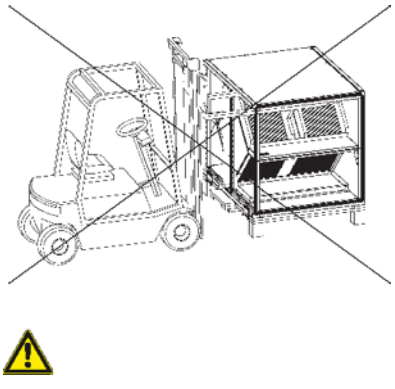


Figure 9. Forklift Lifting Warning

CAUTION
Duct work must be sound insulated and must not be mounted directly on beams, trusses or other critical building parts.

H.2.3 Base frame assembly

Base frame is delivered unassembled for the indoor units that are delivered in sections on pallets. Assembly of the base frame is illustrated on 4 pages in a manual in a plastic bag which is attached to one of the large base frame parts.

There are two types of base frames:
1.118 mm high base frames
2.218 mm high base frames

H.2.4 Installation on the site of unit sections at the base frame when sections are delivered on pallets

Base frame is delivered unassembled for the indoor units that are delivered in sections on pallets. Assembly of the base frame is illustrated on 4 pages in a manual in a plastic bag which is attached to one of the large base frame parts.

There are two types of base frames:
1.118 mm high base frames
2.218 mm high base frames

CAUTION

It is strictly forbidden to lift a section under the top of the section. The plasti c corners and brackets are not at all reinforced for lifting the unit under the top. There is serious danger that the bottom with the heavy components will fall down with the risk of serious injury and damage to property.

Lift up the section by forklifts to the level where the underside of the section is even with the overside of the base frame. Pull the section to the correct position on the base frame by straps - it is maybe necessary to support the section by heavy duty trolleys (see the photos below).

Example of heavy duty trolleys. The trolleys - with the wheels downwards - placed **under the profiles** of the unit section and with a plate placed on the forks of a forklift these heavy duty trolleys are suitable for safe rolling of a unit section over to the base frames.

Pull sections together with a strap. We recommend the shown type of strap because this type is not damaging the frame profiles in the bottom of the units. An example of strap is shown to the right.

Note! To avoid any load and stress on the vertical profiles the strap must be carefully placed on the bottom profiles of the unit when sections are pulled together.

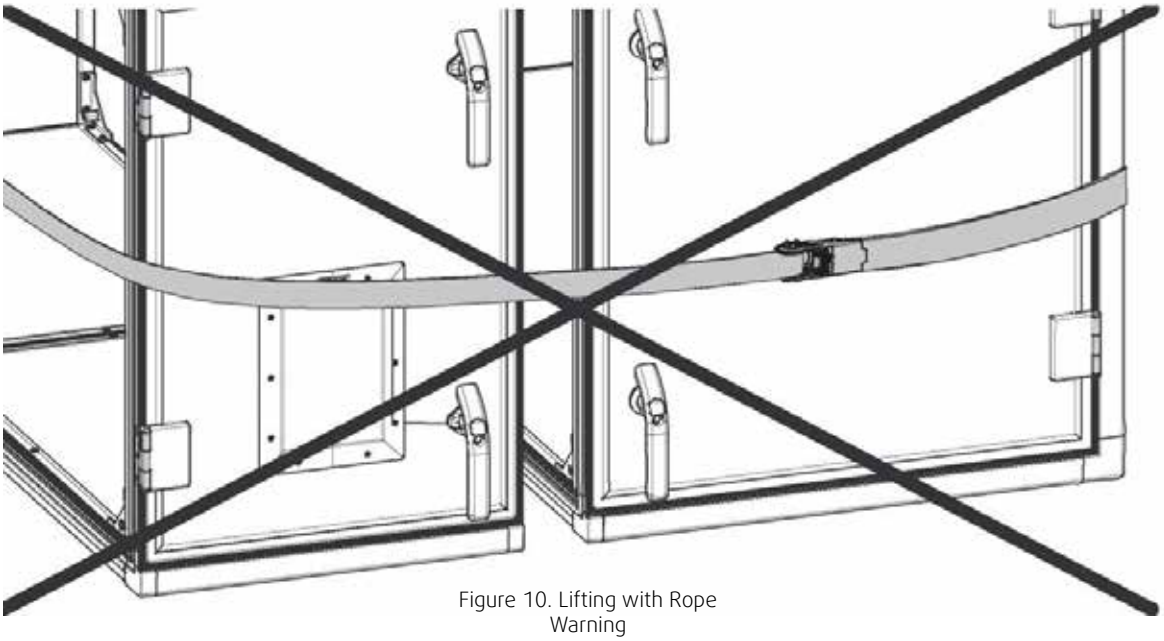


Figure 10. Lifting with Rope
Warning

Note! Never - place the strap on the vertical profile when a section is pulled along the base frame or on the floor.

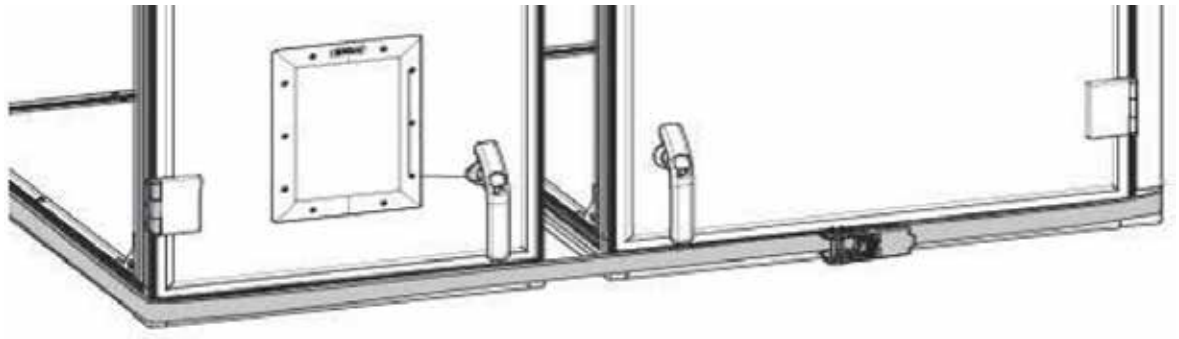


Figure 11. Lifting with Rope from Base Warning

Note! Place the strap on the bottom profiles of the unit to avoid any load and stress on the vertical profiles when sections are pulled together along the base frame or on the floor. The sections must be pulled fully and tight together with the strap placed on the bottom profiles.

Sections are mounted to base frames with self-drilling screws. In the base frame you will find a sufficient number of 5 mm holes that are prepared for the self drilling screws. In this picture you are standing and you are watching the assembled base frame on the floor or roof.

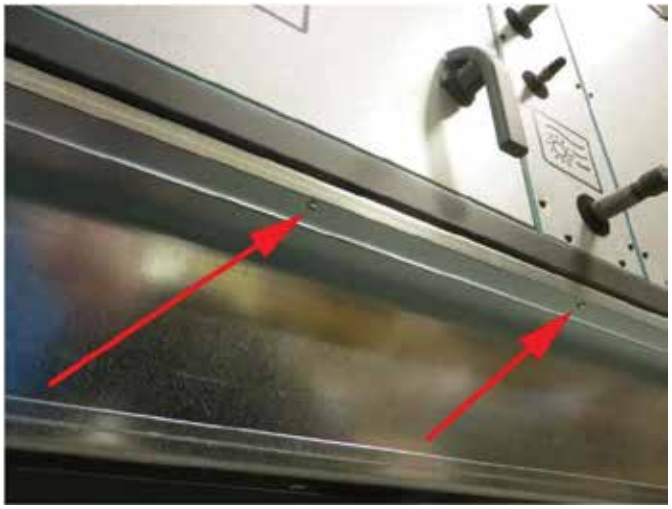


Figure 12. Base Frame Mounting

Use self-drilling screws - 4,8 X 18 mm - to be screwed upward through the holes into the bottom profile of the air handling unit **Note!** A screw must be placed in every hole to achieve the necessary strength. In this picture you are lying on the floor or roof looking upward under the base frame. The screws will not be visible, when you are standing beside the unit looking at the unit

H 2.5 Joining the Ecology Unit sections

The sections must be placed on the base frame and the sections must be positioned directly in line with each other.

Ensure that the internal factory-fitted rubber sealing is undamaged.

The sections are then to be positioned directly opposite each other. If the sections are built with legs, the adjust¬able feet can be used to get the sections in line and at the same height.

Press the sections hard together so that the rubber pro¬files are so flat that the iron frames of the two sections are joined. Strap with tensioner is suitable for pressing the sections hard together.. Note! Do not place the strap on the vertical profiles. The strap must be carefully placed on the bottom profiles of the unit.
The sections must then be locked permanently together with 8 mm bolts and nuts through the grey guiding and connection blocks. Systemair have provided you the 8 mm bolts with round heads and nuts required to carry this task out. An Allen key - size 6 - will be required.

Figure 13. Section Mounting

Assembly has been completed successfully

The grey guiding and connection blocks might be installed inside the units on the vertical profiles. Press the sections hard together so that the rubber profiles are so flat that the iron frames of the two sections are joined. Strap with tensioner is suitable for pressing the sections hard together.

Note! Do not place the strap on the vertical profiles. To avoid any load and stress on the profiles the strap must be carefully placed on the bottom profiles of the unit.

The sections must then be locked permanently together with 8 mm bolts and nuts through the grey guiding and connection blocks. Systemair have provided you the 8 mm bolts with round heads and nuts required to carry this task out. An Allen key - size 6 - will be required.

Note! Do not move the sections together by tensioning the 8 mm bolts and nuts. Tighten the straps for this purpose.

Figure 14. Section Mounting 2

Bracket inside a section. A similar bracket is installed in the next section. This is the bracket in the Geniox sizes 07.07 to 20.25 Press the sections hard together so that the rubber profiles are so flat that the iron frames of the two sections are joined. Strap with tensioner is suitable for pressing the sections hard together.

Note! Do not place the strap on the vertical profiles. To avoid any load and stress on the vertical profiles the strap must be carefully placed on the bottom profiles of the unit.

The sections must then be locked permanently together with 8 mm bolts. Nut with threat is installed from the factory in one of the brackets.

Note! Do not pull the sections together by tensioning the 8 mm bolts. Use the strap for this purpose.

Figure 15. Inside Bracket

H.2.6 Remove transport brackets - when spring mounts are installed

If the fans are installed on spring mounts the transport brackets must be removed after the installation of the air handling unit. Two transport brackets are fitted to the coil springs during transport and installation. Both transport brackets must all be removed to give the full anti-vibration function to the coil springs. The transport brackets are made more visible with yellow labels. After removal of the transport brackets they must be disposed of safely.

After disposal of the transport brackets the yellow label on the outside of the fan inspection door has no function and should be removed.

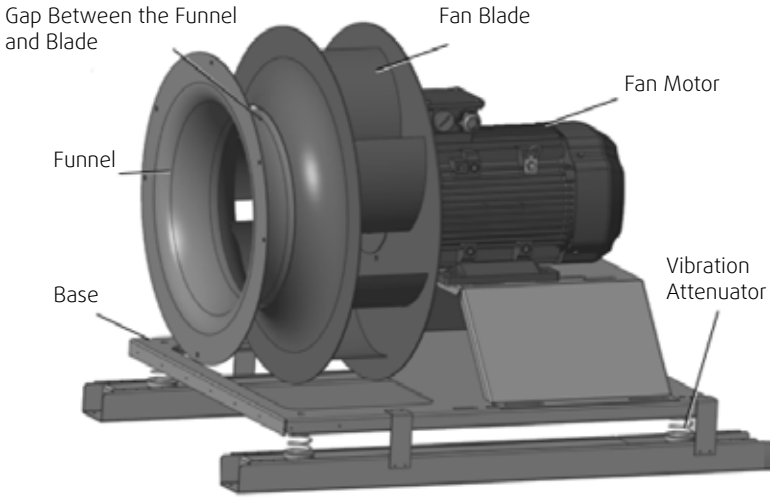


Figure 16. Fan - Motor

H.2.7 Installation of Filters

After the sections have been assembled, the filters that have been sent in a box should be installed. We recommend that the filters be installed after completing the assembly of the sections, to avoid dirt, tearing, or damage to filters.

H.2.8 Installation of the Metallic Filter

Rails have been mounted within the section to enable installation of the metallic filter.

The installation can be finalized by sliding each metallic filter on these rails.

H.2.9 Installation of the Bag Filter

Rails have been mounted within the section to enable installation of the bag filter.

The bag filter should be slid in a vertical position on these rails within the section.

H.2.10 Installation of the EPA/HEPA Filter

Rails have been mounted within the section to enable installation of the EPA and HEPA filters.
The EPA and HEPA filters should be slid in a vertical position on these rails within the section, as shown in “Figure 17”.

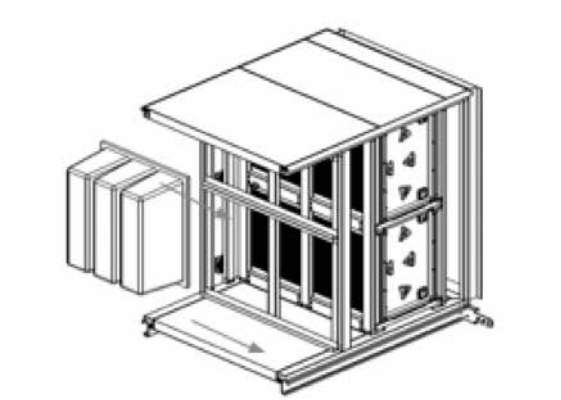


Figure 17: Installation of EPA/HEPA and Bag Filters

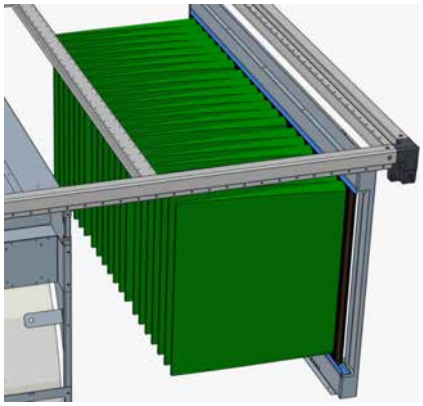


Figure 18: The appearance of EPA/HEPA and bag filters after filter installation

H.2.11 Installation of Active Carbon Filter Cartridges

The plates on which the activated carbon cartridges are to be installed are fixed inside the section at our factory. The cartridges are sent within a package for installation on site. This plate has slots for installing cartridges, as seen in “Figure 28”. The pins on each cartridge should be placed in the wide section of the slots on the plate. Then the apparatus seen in “Figure 19” should be placed on the holes on the other side of the cartridges, and the apparatus should be held from the lever and rotated making sure the slots slide over the narrow section.

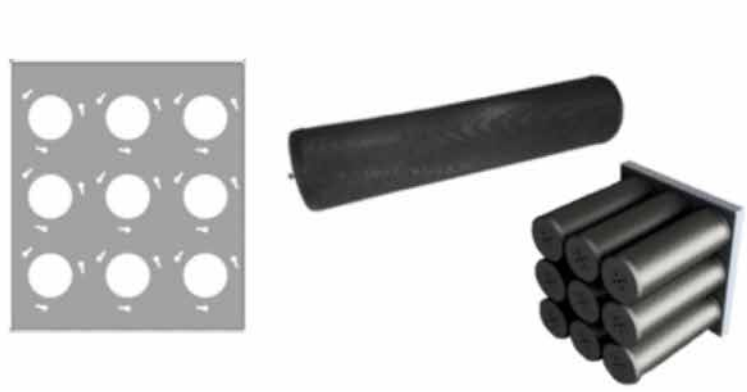


Figure 19: Active Carbon filter catridge and connecting plate

Figure 20: Mounting apparatus for the active carbon filter

H.2.12 Installation of ESP Collector

While placing ESP collectors inside the ecology unit, care should be taken to ensure that the section where the ionizer wires are located face the direction of air intake.

Collectors placed consecutively must be in contact with each other.

The electricity-conducting section at the ESP door must be in contact with the section on the collector that receives the electrical current.

Figure 21: Installation of ESP collectors

H.2.13. Installation of UV-V Lamps

Since these lamps can break during transport, it is preferable to install them on site. For this reason the lamps are supplied inside a box.

Sockets on the Ballasts that are delivered to the site already installed on VoClean units should be installed on the rear section of lamps and these lumps must be driven facing the direction of air flow inside the VOClean.

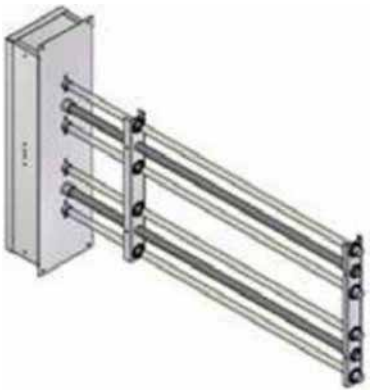


Figure 22: UV-V Lamp and its installation

H.2.14 Installation of the Autowash System

Water that comes into the Autowash system panel is split into branches inside the panel and each branch sends water to each wash groups of the autowash system separately. Once the water pipes located here have been connected, clamps should be used to prevent the pressure inside the pipe from dislodging the hoses.

Figure 23: Connection of water pipes of the Autowash system

WARNING

It is recommended that the length of pipe between the Autowash system panel and the washing group not exceed 5 meters.

Measures should be taken to prevent the water inside the pipes from freezing during winter conditions.

The greasy waste water emerging from the drainage pipe should be passed through a grease trap.

K Start-up, adjustments, use, commissioning and uni tin hipernation

K.1 Documentation is available for download

From www.systemair.com.tr

Your local Systemair company is able to provide the below-mentioned documents and data.

Common

- This User Manual in an order specific version
- Declaration of conformity with production number for this unit and the unique technical data with production number for this unit

K.2 Start-up by installer

All protection and safety measures must be met before start-up of the unit. The mains supply voltage must also be checked too. The mains supply voltage must be measured at the supply terminals in the cabinet.

K.2.1 Checklist, relevant values

K.2.1.1 Checklist prior to start-up

- Is the unit assembled correctly with its functions in the correct order?
- Are the sections and ducts assembled correct?
- Check that fans and anti-vibration mounts are not damaged after transportation and installation.
- Are safety guards installed correctly?
- Ducts - are all ducts installed?
- Are the pressure transmitters installed and connected correctly? (If this is a system with pressure transmitters in the ducts)
- Main power supply:
  - Connected correctly? (3x400 V + N + PE)
  - Test of supply voltage for actuators and control signal!
  - Are control signals for actuators connected correctly?

K.2.1.2 Switch on power

WARNING

Do not start until all safety procedures have been completed and ensure that inspection doors are closed and locked.

Switch on power and the unit should be ready for the start-up.

K.3 Description of functions, if control system is delivered by Systemair

K.3.1 Remote control

K.3.1.1 Communication to BMS systems with MODBUS

The controller has been prepared for communication via RS485 communication port to a MODBUS based BMS system (Building Management System).

The controller can work as a stand-alone system without any support from other controllers.

K.3.1.2 Communication to BMS systems via BACnet

The controller has been prepared for BACnet TCP/IP interface. This can be used for communication with a BMS system (Building Management System).

The controller can work as a stand-alone system without any support from other controllers.

K.3.2 Speed control of fans

K.3.2.1 Control system - frequency converters inside the unit

Fan motor revolutions are controlled by frequency converters, and they are configured and tested to comply with the data for the unit. The frequency converter for each fan motor is installed inside the unit beside the fan motor with ca¬bles between motor and converter. In units with complete control system the frequency converters are delivered with system parameters adapted to the motors and the project.

K.3.3 Cabinet

The models with the cabinet on the unit are exclusively for indoor installation. Terminals are installed in the cabinet for all external components. The number of terminals is always adapted to the individual order.

K.3.4 Damper motors

On/off damper motor, without spring return function. Torque is 5-20 Nm and run time is 150 seconds.

For units not equipped with damper motors, damper blades should be opened with the help of the damper shaft rotating lever before starting the unit. In automated models, no manual intervention should be made on the damper.

Although the electrical cables leading to the damper motor are wired to the unit panel prior to shipping the unit, the cables may have been dislodged during shipping. For this reason, electrical connections should be checked.

K.3.5 Filters

Metallic filters are pre-installed at the Systemair factory to prevent damage to ionizers found on ESP collectors and to prevent solid particles from entering collector plates.

Bag filters, EPA/HEPA filters, and activated carbon filter cartridges are sent inside a box to prevent them from becoming dirty and causing loss of efficiency.

Care should be taken to ensure that filters are installed as explained in the installation section, and that there are no missing filters.

Care should be taken to ensure that bag filters are installed vertically. Otherwise the pockets will overlap, which will lead to pressure loss.

Care should be taken to ensure that activated carbon cartridges are tightly fitted on the slots of the plate, and that they will not move out of position. Otherwise air will leak from gaps in the cartridge slots and odor elimination will not be effective.

WARNING

Bag, EPA, HEPA and Active Carbon filters can not be washed or cleaned.

These filters should be replaced when their useful life has ended.

K.3.6 Fan and Fan Motor

Although the electrical cables leading to the fan motor are wired prior to shipping the unit, the cables may have been dislodged during shipping. For this reason, electrical connections should be checked.

Since a door switch is installed on the door of the section housing the fan and fan motor, the fan will not operate when the door of this section is open. Care should be taken to ensure that this door is closed.

Check whether the fan moves freely without being hindered by the body, flexible connections or cables.

Rotate the fans manually to check whether they turn easily. Make sure there are no foreign substances in the fan section.

K.3.7 ESP

Although no additional wiring is needed since the unit will be supplied with all electrical cabling already installed, cables should be checked lest they have been dislodged during shipping.

Care should be taken to ensure that the open/shut button or cam switch that can be located on the ESP door on the ecology unit is in the open position.

If any component section has a door switch and if the door to the section is open the ESP will not operate. Therefore care should be taken to ensure that doors are closed.

K.3.8 Autowash System

230V, 50Hz electrical supply should be connected to the unit for the Autowash system to operate.

Once the water pipes have been installed as instructed in the assembly section, the valve for the water that will be supplied to the Autowash system should be opened.

The water pressure should be read from the manometer shown in “Figure 24” and the read pressure value should be around 2 bar.

Note: Maximum permissible pressure is 7 bar.

Figure 24: Internal setup of the Autowash system

The detergent tank seen in “Figure 24” should be filled with degreasing detergent to clean the grease from electrostatic filters.

Then the power supply to the Autowash system panel should be turned on. At this stage, the orange lamp on the panel seen in “Figure 25” which indicates that the system is in operation will light up.

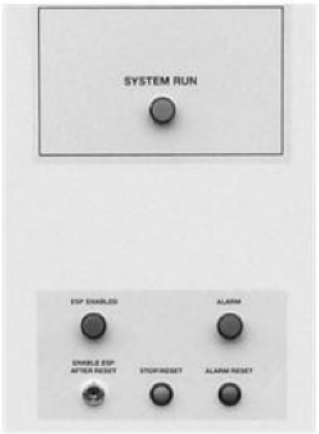


Figure 25: Indicator lights and buttons on the panel

Afterwards, the lock below this lamp should be opened using its dedicated key in order for the “ESP Enable” lamp (green) to come on.

Figure 26: ESP activator lock and key

If the blue alarm lamp seen on “Figure 27” is on, this means that either the water pressure is too low, or the water valve has not been opened, or there isn’t enough detergent in the detergent tank. The reason for this light being on can be read from the PLC display as seen in “Figure 28”.

Figure 27: The alarm lamp and alarm reset button

In order to turn the blue alarm lamp off, the correct action should be taken as written on the PLC screen: opening the water valve, raising water pressure or filling the detergent tank.

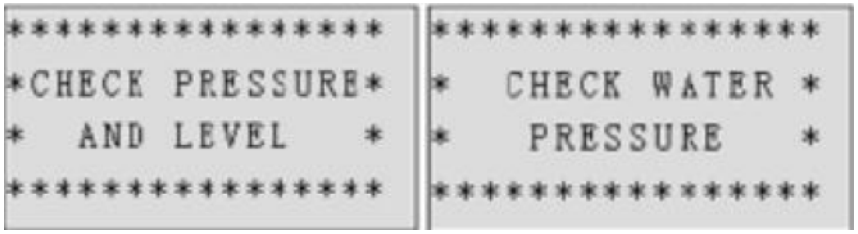


Figure 28: Reading the reason for the blue alarm light being on from the PLC screen

Then, the blue “Alarm Reset” button seen on “Figure 29” should be pressed. Anytime this button is pressed, the red “Stop/Reset” button seen in “Figure 40” should be pressed subsequently.

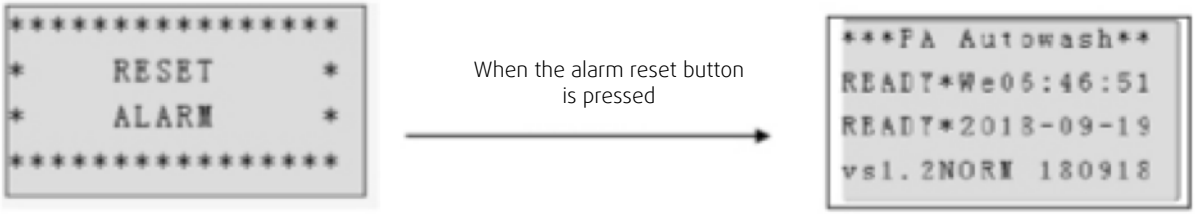


Figure 29: The alarm reset procedure and the text displayed on the PLC screen

Figure 30: The Stop/Reset Button

The “Start” button located to the left of PLC as seen in “Figure 31” should be pressed to start the wash cycle. Once this is done, the green light will come off and the orange light will come on.

Figure 31: The Start Button

The PLC screen displays the current stage of the wash cycle.

NOTE: If you want to urgently stop the washing process, you need to press the “Stop/Reset” button seen on “Figure 30”.

The washing procedure involves various steps. These are:

- Stopping the operation of the ecology unit
- Waiting for the ESP to discharge and for the fan to stop
- Pre-wash
- Waiting for the water to stop dripping
- Detergent spray
- The reaction between the detergent and grease
- Rinse

These steps are repeated several times which concludes the washing procedure.

The fan is operated for a certain amount of time to dry the wet ESP collectors, then the system is placed on full standby for a period of time.

After the allotted time has elapsed, the ecology unit comes back online.

Each wash cycle is completed in a set period and these periods can be reprogrammed if wanted.

To do this, press the “ESC” button on the PLC. You can change the sections you want by using the “Parameters” and “Clock” menus from the displayed menu.

The procedure for making these changes is shown in “Figure 32”.

Reprogramming is not recommended.

Figure 32: Reprogramming the washing period over PLC

K.3.9 UV-V

Although no additional wiring is needed since the unit will be supplied with all electrical cabling already installed, cables should be checked lest they have been dislodged during shipping.

UV-V lamps should be installed in their proper places as described in the assembly section.

Since all sections housing UV-V units have door switches, all doors must be closed for the unit to operate.

K.3.10 Odor Neutralizing Unit

During initial installation of the odor neutralizing unit, care should be taken to ensure that the angular section of pipe which extends into the ecology. If the angular section of the pipe is facing another direction, the pipe should be rotated so it faces the right one. Otherwise the air inside the air handling unit will enter the pipe and hinder the function of the odor neutralizing unit.

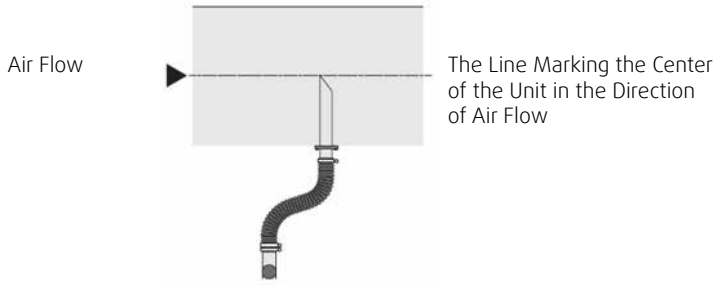


Figure 33: Position of the odor neutralizing unit's pipe inside the ecology unit

Since the pipes of the odor neutralizing unit fit together tightly, care should be taken to ensure that they are not dislodged.

If the electrical connection of the odor neutralizing unit is to be performed on site, the connection should be made according to 220-240V/1 Phase/50 Hz.

INFORMATION

Due to the working principle of the odor neutralizing unit, the ecology unit on which the device is installed and the ducts downstream of the ecology unit must all be grounded. Otherwise the ionized odor neutralizing agent in vapor form will not electrically adhere to all odor particles.

Before operating the ecology unit, the odor neutralizing agent must be filled in the fill tank opening shown in "Figure 44" and the level of the fill should be observed from the level indicator window seen at the bottom right of the photo.

INFORMATION

During the filling of the odor neutralizing agent, the fan speed setting in the odor neutralizing unit should be switched to the off position.

As the ecology unit is brought online, the "Power" button seen in "Figure 44" must also be pressed.

When the system begins operation, the amount of odor neutralizing agent vapor can be adjusted by using the fan speed setting seen on the top left of "Figure 44". When this setting is adjusted to the highest value, 90% of the odor can be eliminated from air that passes through at a flow rate of 15,000m^3/h.

The proportion of odor elimination based on the flow rate of exhaust air can be calculated based on this percentage.

Figure 34: Internal view of the odor neutralizing unit panel

The quantity of odor neutralizing agent vapor that comes out of the odor neutralizing unit can be adjusted using the vapor control damper seen in “Figure 35”.

INFORMATION

During initial startup it is recommended that:
The vapor control damper be kept shut and the fan speed should be adjusted to position number “3”, then the vapor control damper be opened in stages, and once the vapor control damper has been opened completely, the fan speed setting should be proportioned to the air flow rate.
This will ensure most efficient operation of the odor neutralizing unit.

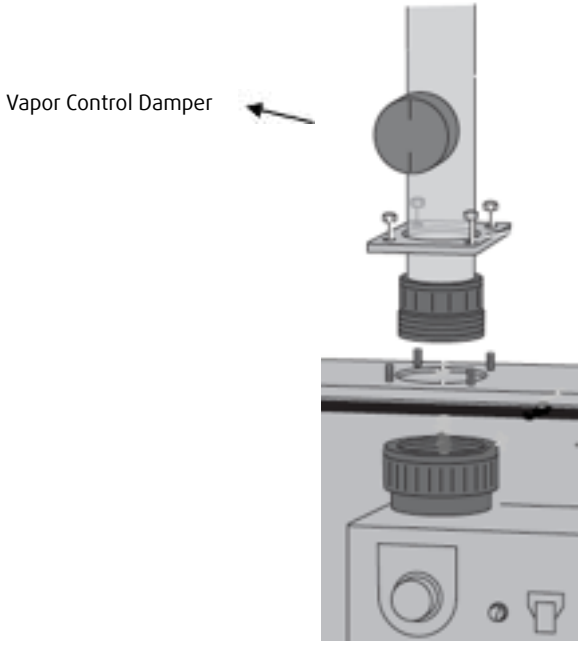


Figure 35: Vapor control damper

L Information about the residual risks

L.1 Unit casing

L.1.1 Design of the machine to make transport safe

Hazards/dangerous area:

- Incorrect handling during transportation may cause that the unit is dropped.

Dangerous incident:

- If a person is hit by a unit that is dropped, this could in unfortunate circumstances lead to irreversible injury or death.

Claim for reduction of danger:

- Correct handling during transportation is described in this manual. If lifted by fork-lift truck the forks of the truck must be sufficiently long. Safety measures are also described in this manual by use of crane. Information about weight of each section is also visible.

L.1.2 Common for all unit sections

L.1.2.1 Risk caused by surfaces, edges and corners

Hazards/dangerous area:

- Sharp edges on plates might occur inside the machines as well as sharp edges on frames of dampers. No sharp edges on the outside of the units.

Hazards/dangerous area:

- Sharp edges on plates might occur inside the machines as well as sharp edges on frames of dampers. No sharp edges on the outside of the units.

Dangerous incident:

- Cut fingers/hands.

Claim for reduction of danger:

- Risk only exists during maintenance and cleaning. This takes place at least once every year. Use of gloves and hel¬met is described in this manual. Cut-resistant gloves for protection against injury from sharp metal plate edges. Use CE-marked gloves for this purpose. Lamps mounted inside the unit with sufficient lighting reduce the risk of injury.

L.1.2.2 Risk caused by maintenance and cleaning of dampers

Hazards/dangerous area:

- Are between the damper blades and the system of bars and links between motor and damper blades.

Dangerous incident:

- Crushing of fingers.

Claim for reduction of danger:

- Risk only exists during maintenance and cleaning. This task must be done by skilled technicians that are aware of this risk.

L.1.2.3 Risk caused by maintenance and cleaning of attenuators

Hazards/dangerous area:

- High concentration of dust on the surface of the baffles might be harmful to the health.

Dangerous incident:

- To breathe in particles that is harmful to the health.

Claim for reduction of danger:

- Risk only exists during maintenance and cleaning. This takes place at least one time every year. Use of particulate respirator is described in this manual. Particulate respirator- maintenance free including foam face-seal and adjust¬able pre-threaded headbands (same particulate respirator as recommended for change of filters).

L.1.2.4 Risk caused by missing change of filters

Hazards/dangerous area:

- Missing change of filters and missing maintenance decrease the capacity and final consequence will be breakdown.

Dangerous incident:

- By extensive lack of of filter change and maintenance the machine can break down.

Claim for reduction of danger:

- In the manual is the method and schedule for change of filters and maintenance specified.

L.1.2.5 Risk caused by the execution of filter change

Hazards/dangerous area:

- Filter panels and filter bags

Dangerous incident:

- To breathe in particles that is harmful to the health.

Claim for reduction of danger:

- Use of particulate respirator- maintenance free including foam face-seal and adjustable pre-threaded headbands (same particulate respirator as recommended for cleaning of attenuators.

M Instructions on the protective measures during repair and maintenance

Use the below-mentioned personal protective equipment for maintenance:

- Cut-resistant gloves for protection against injury from sharp metal plate edges. Use CE-marked gloves for this purpose.
- Helmet
- Particulate respirator- maintenance free including foam face-seal and adjustable pre-threaded headbands - for replacing filters.
- Tools to block the impeller during repairs and maintenance if stack effect-also called chimney effect - in the ducts create air flows that drives the impellers by turned off motors

N The conditions of stability during use, transportation, assembly, dismantling when out of service

The unit must always be handled in an upright position. Never tilt any section more than 15 degrees. If sections must be tilted more than 15 degrees, sections with fans or rotating exchangers that can be drawn out for service must be secured carefully. During transportation, installation, dismantling or other handling, it must be secured that all components in the unit are properly fastened and with additional attention to the control of anti-vibration mounts under the fans that they are undamaged. The mounting and smooth running of the fans must be controlled and handled with great care.

N.1 Installed reliable to avoid units to be tilted or moved by storm

Units installed on roofs and other places with the risk of heavy winds must be installed reliable to avoid that they can be tilted or moved by the any storm. The base frame is provided with holes that are intended for fastening by sufficient bolts and fittings supplied by the installer.

N.2 General disassembly - sharp edges

Pay attention to several sharp edges during dismantling and disposal of the unit. To avoid injury, CE-marked cut-resist¬ant gloves as well as helmet must be used. The measures are described further in the Maintenance, Dismantling and Disposal Manual.

O Instructions for machinery where these are regularly to be transported

The subject in the Machinery Directive about machinery that are regularly to be transported does not exist for the Geniox VOClean ecology units, because those units are specially made for one intended application.

P The operating method to be followed in the even t of breakdown. Safe restart.

Use the below mentioned procedure in the event of breakdown or blockage:

- Switch off the power and lock the automati c cir cuit breaker by padlocks in the off position.
- Remove the reason for breakdown or blockage.
- Follow the start-up procedure described in chapter K.

Q Adjustment and maintenance operations

Must be performed by skilled technicians.

In connection with demands for compensation, Systemair must have full and unhindered access to all relevant reporting on service, repair, modification and use since the unit was transferred from Systemair to a transport company at the Systemair factory. It is a condition for compensation that maintenance outlined on the following pages has as a minimum been performed.

R Recommended maintenance intervals

By performing the simple cleaning and maintenance procedures described below, following the relevant warnings and taking the necessary measures, most problems will be spotted and a full downtime for the system will be avoided.

The maintenance intervals specified may vary depending on specific operating and environmental conditions. Therefore an annual detailed examination is needed in addition to the periodic maintenance tasks specified.

WARNING

The specified maintenance and cleaning intervals are recommended values. It would be the more correct approach for you to determine your own periods according to your degree of use and your cuisine.

R.1 Casing

Region	Interval	Instructions
Internal Unit Surfaces	3 Months	Grease and dirt can accumulate on internal surfaces (particularly on the edges of bypass plates) since greasy, smoky, and dusty air will pass through the unit. These residues may cause bad odors, sticky areas, and corrosive effects within the air handling unit.
		Wipe internal surfaces, especially the edges with a clean and moistened cloth at recommended intervals.
External Unit Surfaces	6 months	Dust will accumulate on the unit, depending on the environment in which the unit is located. This may lead to bad odors and corrosion on the unit.
		Wipe external surfaces of the unit with a clean and moistened cloth at recommended intervals.

R.2. Filters

Region	Max. Differential Pressure (Pa)	Instructions
Metallic Filters		The cleaning period of metallic filters will change according to intensity of use and the type of cuisine. Therefore it is recommended that maintenance and cleaning be performed at intervals determined according to to intensity of use and the type of cuisine.
		Remove panel filters by sliding them toward yourself. If there are tears or pores in filters, replace them.
		If the filters are in good condition, wash the filter thoroughly using water at 50-60°C and degreasing detergent. You can use pressurized water for this purpose. Dry the filter using a dryer or under ambient conditions. Clean inside and around the sliding filter mount with a cloth moistened with a mixture of water and detergent, then dry with a cloth. Replace the filter on its slide following the cleaning and drying procedure. Make sure the filter sits firmly on the slide, and that there is no gap between filters.
Bag Filters	300	Since bag filters are manufactured from synthetic materials, they are not suitable for washing. They are therefore suitable for single use.
		Differential pressure switches can be used to determine the dirtiness status of filters. (Optionally) When the pressure differential value reaches a certain level, this indicates that the filters need to be replaced.
		A yellow LED lamp on the panel will come on when bag filters are full in automated units. In advanced automated units, a red error lamp will come on on the panel and a description of the error will be displayed on the monitor. If there is no automation, replace filters at specific intervals or check the fullness of filters by measuring pressure loss yourselves.
		If the filters are full, open the access door to the section housing the filters and slide the filters out of their mounts. Before installing the new filters on the slide, wipe inside and around the slide with a clean, moist cloth. Then, place the new bag filters on the slide. Make sure that filters are installed correctly, that there are no gaps between filters, and that the bags have been installed in a vertical position. Make sure filters have been installed correctly with respect to the direction of air flow.
EPA/HEPA Filters	600	Since EPA/HEPA filters are manufactured from synthetic materials, they are not suitable for washing. They are therefore suitable for single use.
		Differential pressure switches can be used to determine the dirtiness status of filters. (Optionally) When the pressure differential value reaches a certain level, this indicates that the filters need to be replaced.
		A yellow LED lamp on the panel will come on when EPA/HEPA filters are full in automated units. In advanced automated units, a red error lamp will come on on the panel and a description of the error will be displayed on the monitor. If there is no automation, replace filters at specific intervals or check the fullness of filters by measuring pressure loss yourselves.
		If the filters are full, open the access door to the section housing the filters and slide the EPA/HEPA filters out of their mounts. Before installing the new filters on the slide, wipe inside and around the slide with a clean, moist cloth. Then, place the new EPA/HEPA filters on the slide. Make sure that filters are installed correctly, that there are no gaps between filters, and that the bags have been installed in a vertical position. Make sure filters have been installed correctly with respect to the direction of air flow.

Filter Type	Interval	Instructions
Active Carbon Filters		Active carbon filters are not suited to washing due to their nature. Therefore, when the useful life is complete, carbon particles inside the cartridge should be removed and the cartridges should be filled with fresh carbon particles, or the cartridge should be directly replaced with a new full cartridge.
		Replace your activated carbon filter by setting an interval depending on your type of cuisine and intensity of use. Alternatively, replace active carbon filters when you sense that odor is no longer being eliminated.

R.3. Autowash System

Region	Interval	Instructions
Water Pipes Of The Autowash System	1-2 Weeks	Checks should be performed on regular intervals to make sure that the pipes used in the Autowash system have not been dislodged and that there are no holes in pipes.
		If the pipes have been dislodged, they should be fixed in place and well tightened using clamps. If there are holes in the pipes and there is a water leak, the pipes should be replaced with identical ones or pipes with similar specifications.
		During winter, in cases where the washing function is disabled the water remaining in the pipes may have frozen. In this case damage can occur to the system and the washing function cannot be carried out.
		In such cases the frozen water inside the pipe can be thawed by pouring warm water on pipes or another process that will achieve the same end without damaging pipes can be applied.
		Water pipes can be wrapped in insulation materials to prevent freezing.
Autowash System Washing Group	1-2 Weeks	The washing group comprises nozzles and the metallic framework on which the ESP collectors are mounted.
		Checks should be performed on regular intervals to make sure there is no clogging in nozzles (due to calcification, grease accumulation, etc. reasons) or any bending or breakage in nozzles.
		In case of clogging, the ends of nozzles should be wiped with a cloth moistened with a mixture of water and detergent, and the section where the water is sprayed should be cleared thoroughly using pressurized air if necessary.
		Any impact that will occur on the nozzles during the removal and mounting of ESP collectors can cause the nozzles to bend or break. In such a situation, you should contact the manufacturer and request a new nozzle, and remove the old nozzle and install the new one in its place.
ESP Pan of the Autowash System	1-2 Months	These pans are manufactured of stainless steel material and are equipped with drainage pipes manufactured of stainless steel material conforming to the DN32 standard. Each of these drainage pipes should be connected to a single drainage pipe and the greasy waste water should be passed through a degreaser. Ball siphons or plugs should not be installed on the ends of drainage pipes. Although the washing process will occur every night, oily residues can occur on the surfaces of pans after a while. These residues should be thoroughly cleaned at specified periods, using a cloth and mixture of water at 50-60°C and degreasing detergent.

WARNING

Before performing maintenance and cleaning tasks the power supply to the ecology unit must be cut off, and the cam switch or on/off button on the panel of Autowash system panel should be switched to the off position.

Wait 60 seconds for any static electricity load to be dissipated.

R.4. ESP (Electrostatic Filter)

Region	Interval	Instructions
ESP Pan	1 Week - 3 Months	Remove the ESP pan by sliding it toward yourself.
		Clean the oil residue inside the pan at specified periods, using a cloth and mixture of water at 50-60°C and degreasing detergent.
		Make sure the pan is dry before replacing it.
The Inside of the ESP Unit	1 Week - 3 Months	Remove the ESP collectors by sliding them toward yourself.
		Oil residue can form inside the unit housing the ESP collectors. Clean the inside of the unit thoroughly using materials such as spatula, brush, moistened cloth, degreaser etc. at specified intervals.
		If there is oil or dust residue on the electrical cable lugs on the internal surface of the door, clean them with a moist cloth and degreaser.
		Care should be taken to ensure that the inside of the unit and the electrical cable lugs are thoroughly dry before replacing the ESP collectors.
Region	**Interval**	**Instructions**
ESP Collectors	3 Days - 3 Months	Remove the ESP collectors by sliding them toward yourself.
		Wash the ESP collectors at specified intervals with detergent water at 50-60°C thoroughly but carefully without damaging the aluminum plates and ionizer wires.
		Check whether any ionizer wires have been broken during the washing process. Remove the broken wire as needed. Loop the end of the new ionizer wire in its proper place in the bus bar as seen in "Figure 46" and pull against the spring loading force and place it on its opposite end.
		You should check for any bending in aluminum plates while cleaning the ESP collectors. If there is bending, you can straighten the plates without damaging them, using appropriate materials. If there are major distortions that can not be corrected, contact the manufacturer and request a new plate.
		Care should be taken to ensure that all parts which have been washed and cleaned are thoroughly dry before replacing the ESP collectors.
		If there is more than one ESP collector in your unit, make sure electrical cable lugs between them are in proper contact.
		Make sure that the ESP collectors have been installed correctly according to the direction of air flow.
		Take care that the contact gears on the door and the contact pins and the contact spring within the collector are in the correct positions when the door is closed.

WARNING

Before performing maintenance and cleaning tasks the power supply to the ecology unit must be cut off, and the cam switch or on/off button on the ESP section should be switched to the off position.

Wait 60 seconds for any static electricity load to be dissipated.

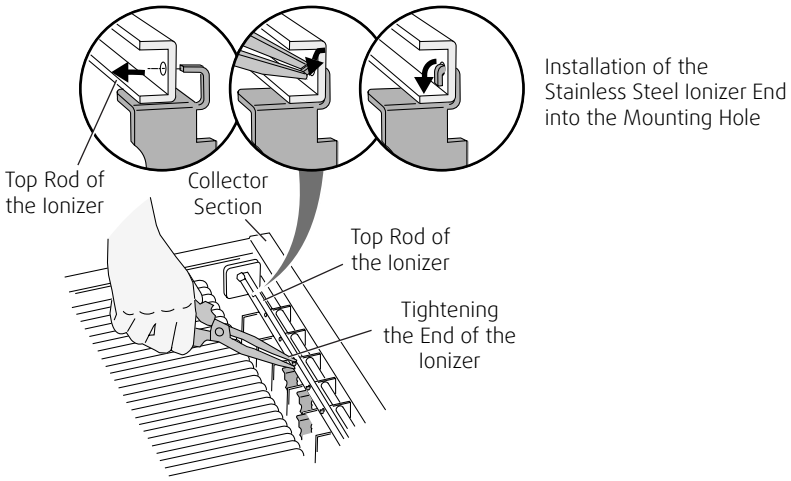


Figure 36: Installation of Ionizer Wires

INFORMATION

Once you have completed the maintenance and cleaning procedures and started the ESP device, crackling or arcing sounds can be heard initially as the system begins to load. This is completely normal.

WARNING

If the crackling and arcing sounds continue and if the green" in operation" lamp comes off, this means there is a problem with the device. In this case cut the electrical supply to the unit and alert service teams.

The use of ESP's under -10°C and over 60°C and 75% relative humidity is not recommended.

WARNING

Delaying maintenance can cause fires.

R.5. UV-V

Region	Interval	Instructions
UV-V Lamps, Ballasts, and Electrical Connections	1 Month	Visual checks should be performed on a regular basis to see whether the lamps are on or off. There is a LED light installed on the ballasts outside the UV-V section to indicate whether the lamp is on or not. The moment one of the UV-V lamps are off, this LED indicator light on the lamp's ballast will come on.
		If UV-V lamps do not come on, electrical and socket connections should be checked. If there are no problems, the lamp must be replaced.
		Dust can accumulate on the surfaces of lamps in time. Before conducting a visual inspection to determine such accumulation, the power supply of the ecology unit must be disconnected. After waiting 1 minute, the door of the UV-V section should be opened. If there is dust, soot etc. on the surfaces of UV-V lamps, these surfaces should be gently wiped with a moistened cloth.
		The staff performing the cleaning should wear gloves. The lamps should be handled as gently as possible during cleaning.

INFORMATION

UV-V lamps should be replaced every 17,000 hours (approximately 1 year).
Different brands of UV-V lamps can have different strengths. Therefore they do not generate the same quantity of ozone. Installing just any brand of UV-V lamp may lead to insufficient retention of grease and odor. For this reason, please contact Systemair to install the right lamp. The use of UV-V lamps of different brands can nullify UL and CE certification. The unit may be removed from warranty coverage.

WARNING

Incorrect installation, an incorrect setting, incorrect maintenance or improper use can lead to electric shocks, injury or material damage.

Please contact a qualified installer, service agent or supplier for information and assistance.

WARNING

The main power supply switch of the unit must be turned off before installation, maintenance and cleaning operations.

Failure to do so can lead to injuries or death.

UV-V lamps are exceedingly high energy devices. Therefore, the rays generated by UV-V lamps should not come into contact with eyes or skin. For this purpose, gloves, goggles and skin-covering equipment should be used.

UV-V lamps contain small quantities of mercury. In case the lamps break, the areas containing the broken parts and the areas contaminated with mercury should be cleaned with a moist cloth and by wearing gloves.

Since UV-V lamps are exceedingly high energy devices they cause ozone gas to be formed. Above a certain ppm value ozone gas has a harmful effect on organisms or can cause the organism to die. You should not stand at the discharge section of the ecology unit while the unit is in operation, and you should not breathe the air that comes out.

Since air ducts downstream of the ecology unit will be pressurized and since ozone gas will pass through these ducts, air leaks from these ducts should be prevented. Otherwise, any living creates that are in the environment where ducts are located can be harmed.

R.6. Odor Neutralizing Unit

Region	Interval	Instructions
Odor Neutralizing Agent Level Indicator	2-4 Weeks	The odor neutralizing agent level varies according to the flow rate of exhausted air and the amount of odor contained in the exhaust air. On average use, 1 liter of odor neutralizing agent can last 3-4 weeks. The quantity of odor neutralizing agent should be checked at specified intervals and topped off as necessary. This procedure can also be carried out on a daily basis without waiting for the odor neutralizing agent to be depleted, and the agent can be topped of in the necessary quantity. In order to add odor neutralizing agent, you can open the tank lid by turning in the counter-clockwise direction. After the filling is completed, the lid can be screwed back on by turning in the clockwise direction.
		Excessively high odor neutralizing agent will cause overflow and dirtiness inside the odor neutralizing unit. In such cases, the inside of the unit should be wiped with a moistened cloth.

WARNING
The power supply to the unit must be disconnected before performing tasks such as maintenance, cleaning, assembly.
People performing these tasks must wear protective equipment (safety goggles, gloves, etc.) and be qualified to perform such tasks.
Contact with the odor neutralizing agent should be avoided.

WARNING
The odor neutralizing agent is not protected against explosions. It can cause sparks and can not be used in areas where there is a risk of explosion.
The odor neutralizing unit must not be used without proper electrical grounding.

WARNING
The use of the odor neutralizing unit in conditions over 75% RH is not recommended.
The use of the odor neutralizing unit under 5°C or over 56°C temperature is not recommended.
Since air ducts downstream of the ecology unit will be under positive pressure, duct connections must be airtight to prevent the odor neutralizing agent and odor particles from leaking out of these ducts into the atmosphere.

R.7. Heat Recovery Coil

Region	Interval	Instructions
Fins That Increase the Heat Transfer Area	1 Month - 3 Months	Dust may gradually accumulate between the fins that are used for the purpose of increasing the area of heat transfer in the heat recovery coil. This reduces the efficiency of heat recovery. For this reason, the spaces between the fins should be cleaned at regular intervals using pressurized water or pressurized air. Brushes or similar tools can also be used for this purpose.

WARNING
The power supply to the unit must be disconnected before performing tasks such as maintenance, cleaning, assembly.
People performing these tasks must wear protective equipment (safety goggles, gloves, etc.) and be qualified to perform such tasks.

R.8. Dampers

Region	Interval	Instructions
Damper Blades and Seals	12 Months	If a unit with damper motors is used rotate the shaft by pressing the button or if there is no damper motor, rotate the shaft manually using the shaft lever. Check for any jamming in the blades. If there is dust, gravel etc. at the edges of blades which hinder the easy movement of blades, clean with a brush or cloth.
		Clean the dust accumulated on the surfaces of blades with a moist, clean cloth.
		If, when you try to manually rotate the shaft it does not turn, and there is a visible and fixable reason, make the necessary repair using the suitable materials and wearing protective equipment such as gloves, goggles, etc. to prevent work accidents. If a repair is not possible contact Systemair and obtain a new damper.
		Make sure that the seals on the damper blades and frame are intact. If the seals are worn or displaced, replace them.
		If the seals are intact, clean the dust that has accumulated on the seals and around the edges of the seals using a brush or clean cloth. This procedure will extend the useful life of the seals while allowing the blades to close well, better protecting the equipment.
		If, when you try to manually rotate the damper shaft, the shaft does not turn, and this is not due the damper shaft or an object being jammed into damper blades, the problem may be in the gears. Contact Systemair teams in such cases.
Damper Motor	6 Months	Check whether damper motors work. If they do not work, check electrical connections. Since maintenance and cleaning of damper motors is not very feasible, they should be replaced when they are broken.

WARNING

Cut the electrical supply to the unit before starting maintenance and cleaning procedures, and wait at least 1 minute for the rotation of the fan to come to a full stop.

R.9. Fan and Fan Motor

Region	Interval	Instructions
Fan, Fan Motor, And Other Components	4 months	If dust has accumulated on fan blades, clean with pressurized air or a moistened cloth.
		Rotate the fans manually to check whether they turn easily. If the rotation is hindered or if you hear scraping sounds, check the oil of motor bearing shells. Oil and clean at intervals specified by the manufacturer. If the hindrance or scraping sound still persists, check the distance between the fan impeller and funnel. If the gap is not even on all sides, mounting screws may have loosened. Find the loose screw, make the necessary adjustments, and tighten the screw with the appropriate wrench.
		Check the connections of vibration attenuators found on the fan intake. If there are loose screws, tighten with appropriate tools. If there is a tear in these vibration attenuators, replace them.
		Check the screws on the vibration attenuators found under the fan and fan motor group. If there are loose screws, tighten with appropriate tools.
		Check the mounting screws on the bases connected to the fan motor. If there are loose screws, tighten with appropriate tools.
		Check the pressure probes and hoses found in the fan section. Restore any dislodged hoses to their proper positions. If there are any dislodged probes, restore them to their positions, and replace any broken probes.
		Check the connections of electrical cables wired to the fan motor. Tighten any loose connections.
		If there is damage to electrical cables supplying the fan motor, replace these cables.
		Check grounding connections. Tighten any loose connections.

WARNING

Cut the electrical supply to the unit before starting maintenance and cleaning procedures, wait at least 1 minute for the rotation of the fan to come to a full stop, and do not open the door to the fan section in the meantime.

R.10. Troubleshooting

Malfunction	Possible Cause	Solution
Exhaust air is greasy and smoky.	The ESP cam switch may not be on or the on-off button may not have been pressed.	Check the cam switch or the on-off button and if they are in the off position switch to the on position/press the button.
	ESP collectors may be excessively dirty or clogged.	Carry out the procedure described in the maintenance and cleaning section regarding ESP.
		If there is an Autowash System, it may be offline. Carry out the tasks described in the setting and checks section before bringing it online. (Initial startup, filling with detergent, checking the water level., etc.) If there is an Autowash System, the nozzles in the washing group may be clogged, bent, or broken. Carry out the tasks described in the maintenance and cleaning section.
	ESP's electrical connections may have been made incorrectly.	Check all electrical connections for the ESP, and fix any incorrect or missing connections.
	ESP collectors may not be in contact with one another.	When ESP collectors are placed one after the other, the sections transmitting and receiving the current must be in contact with one another.
	One or more of the UV-V lamps may have broken down or expired.	Replace lamps.
	Electrical connections of UV lamps may have been made incorrectly following maintenance and cleaning.	Check electrical connections of UV-V lamps. Make sure that sockets coming out of ballasts are attached to UV-V lamps in the manner described in the assembly section.
Exhausted air smells bad.	The useful life of the activated carbon filter may have expired.	Replace the activated carbon cartridges or the carbon within the cartridges.
	Activated carbon cartridges may not be positioned firmly in their slots.	Check whether the cartridges have been firmly positioned. If any cartridge does not sit firmly in its slot, put the cartridge in its slot with the help of the mounting apparatus.
	The activated carbon filter contact time may be insufficient for your kitchen.	Choose a unit with double stage activated carbon filters.
	One or more of the UV-V lamps may have broken down or expired.	Replace lamps.
	The vapor control damper of the odor neutralizing unit may have been left in the off position.	Open the vapor control damper.
	The odor neutralizing agent of the odor neutralizing unit may be depleted.	Refill the odor neutralizing agent in the odor neutralizing unit as described in the maintenance and cleaning section.
	The speed setting of the fan inside the odor neutralizing unit may have been left in the "OFF" position.	Increase the fan speed setting inside the odor neutralizing unit gradually.
	The odor neutralizing unit may be offline.	Check electrical connections of the odor neutralizing unit. Make sure the unit is supplied with electrical current.

Malfunction	Possible Cause	Solution
Air flow rate in the unit is too low.	The frequency at the potentiometer or inverter may be at a low level.	Increase the rotational speed of the fan by rotating the potentiometer in the positive direction or by increasing frequency from the inverter.
	Filters may have been filled with dirt and be causing additional pressure.	Check the pressure loss at filters. If maximum pressure loss has been reached, replace filters.
	Air ducts upstream of the ecology unit can be filled with grease and dirt and may be causing extra pressure due reduced air flow cross-section area.	Clean or replace air ducts upstream of the ecology unit.
The unit's operation is noisy.	Screws and bolts may have come loose in vibration attenuators or damage may have occurred at attenuators.	Check screws and bolts, tighten any loose ones using appropriate equipment.
	During the handling of the ecology unit, parts are used to stabilize the base of the fan-motor group and to prevent vibration attenuators from breaking. These parts may not have been removed during commissioning.	Remove the stabilizing parts from the fan-motor base.
	The fan-motor group may have shifted off axis, and may be scraping the funnel.	Check the connections of the fan-motor group with the base, and of the fan base to the floor of the unit. If there are any loose screws or bolts, align the fan-motor group along the correct axis and tighten all screws and bolts.
	Damage may have occurred in fan blades, causing imbalance during rotation.	Manually check the rotation of the fan. Check for any oscillation during rotation and for any damage to fan blades. If there is damage, contact the manufacturer.
	Damage or flexing may have occurred in the floor on which the unit sits.	If the noise persists despite all checks, lift the unit with the aid of proper equipment and a crane and check the floor. If there is a dent or damage which may cause vibration, repair the flooring.
Crackling and arcing sounds are coming from the device.	ESP collectors may have been re-installed before being fully dried.	Remove the ESP collectors, and if they are not thoroughly dry, dry and re-install them.
	Plates of ESP collectors may be excessively dirty.	Carry out the procedure described in the maintenance and cleaning section regarding ESP.
	Plates of ESP collectors may have been bent.	Remove the ESP collectors, and if there is bending in the plates, straighten the plates using appropriate equipment and re-install the collectors. If there is irreparable damage, contact the manufacturer.
	Solid particles may have been left between ESP collectors.	Remove the ESP collectors. Check for solid particles on the plates and inside the section, and clean any with a clean cloth.
	One or more of ESP ionizer wires may be broken.	Remove the ESP collectors. If an ionizer wire is broken, install a new ionizer wire as described in the maintenance and cleaning section. If there are no ionizer wires available, contact the manufacturer.
	ESP collectors may not be in contact with one another.	When ESP collectors are placed one after the other, the sections transmitting and receiving the current must be in contact with one another.
Unit is not working.	Your unit's emergency stop button may have been pressed or its cam switch may have been brought to the off position.	Check the emergency stop button and the cam switch. If they are off, turn them on.
	The unit may not be receiving electrical current.	Make sure that the panel to which the unit is connected is active, and that the electrical cable connections to the panel and the unit have been made properly. If the panel is not active, render it active. If there are any loose or dislodged electrical connections, correct as needed.

S Components and Technical Specifications

The Geniox VOClean Ecology Unit is tasked with cleaning the greasy, foul smelling, dirty, smoky exhaust air from industrial kitchens.

Various components are used to perform this function. These components have been explained in detail below.

S.1 Electrostatic Filter (ESP)

The electrostatic filter is made up of two main parts.

These are; the collectors that are tasked with retaining the grease and smoke in the exhausted air and the panels that are tasked with supplying energy to these collectors.

Collectors eliminate the grease and smoke inside the exhaust air in two stages.

The first stage contains ionizer springs of stainless steel material. Ionizer springs are tasked with adding a negative charge to particles in the air. The second stage contains aluminum plates. These plates that are kept under high voltage and create a magnetic field.

The negatively charged particles in the air stick to the plates inside the magnetic field due to electrical forces. Particles stuck to the plate surfaces collect here and flow to the pan found under the collectors.

This operating principle has been shown in “Figure 37” and components of the ESP unit have been shown in “Figure 38”.

The efficiency at which the grease and smoke is eliminated from the exhaust air can be increased by increasing the ESP stage.

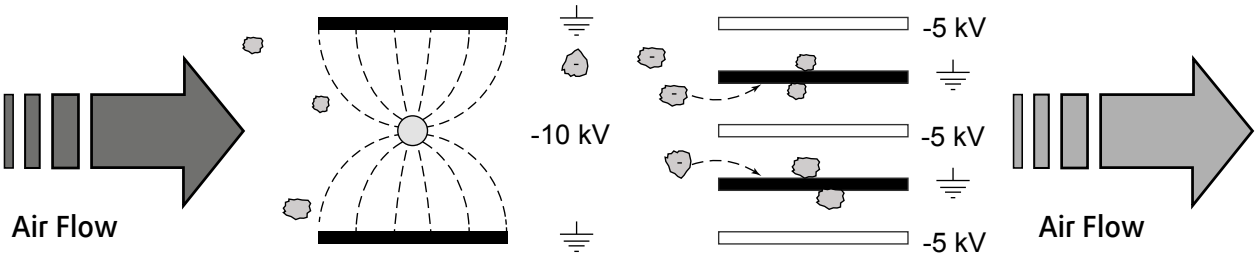


Figure 37: Operating Principle of ESP

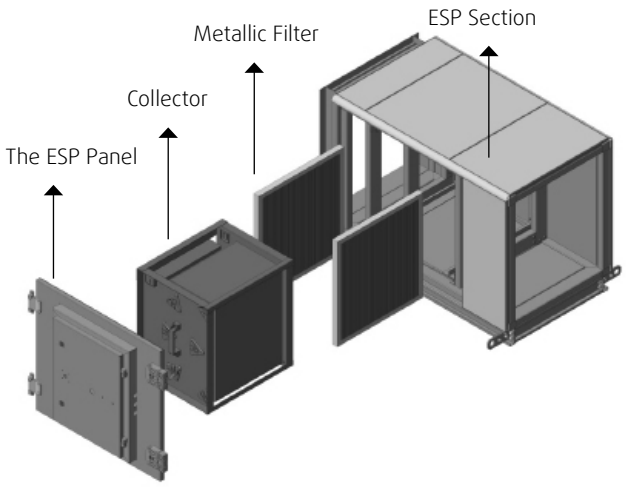


Figure 38: ESP Unit

Technical specifications of the ESP used in the Geniox VOClean Ecology Unit are shown in "Table 3" and the panel is shown in "Figure 39".

ESP 1500 Technical Specifications	
Power Consumption	20 Watts
Maximum Capacity	0,7m^3/s
Power Supply	1" / 220-240V / 50 Hz
Filter Efficiency	%98

Table 3: ESP Technical Specifications

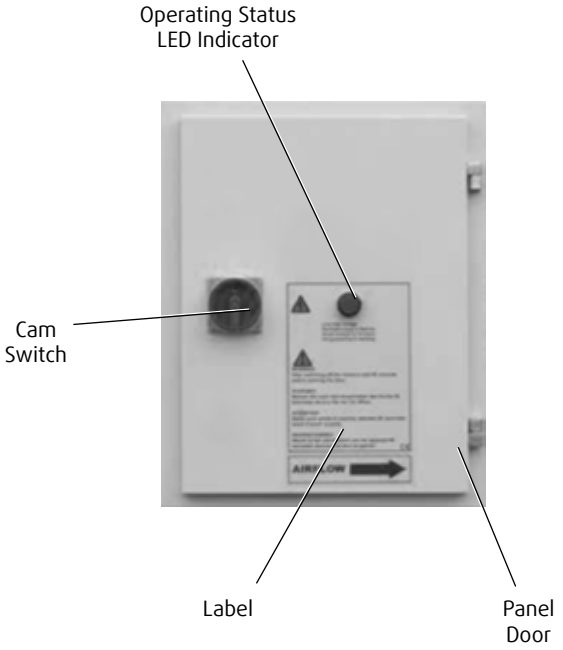


Figure 39: ESP Panel

S.2 Autowash System

During the course of operation of ESP's (electrostatic filters) residual grease and dust that has not flown to the pan accumulates on collector plates. This accumulation can reduce the efficiency of the ESP and cause fires.

Therefore, collectors may need to be removed and washed manually at frequent intervals (every 3 days).

Automatic washing system is offered as an option with the Geniox VOClean Ecology Unit in order to reduce the frequency of manual washing.

"Figure 40" shows the panel and washing group of the Autowash System.

2 nozzles are used per washing group for each ESP collector.

A line from the boiler should be connected to the autowash system to deliver water at 60°C and at a minimum pressure of 2 bar.

This water is delivered to the nozzles after the addition of detergent at various intervals by means of the PLC inside the panel.

3-angle pans are used to drain the oil-water-detergent mixture that is formed during the washing process.

Figure 40: Panel and washing group of the Autowash system

"Table 4" shows the electrical specifications of the autowash system.

Mains Power Supply for the Autowash System	230V-50Hz-6Amp
Power	35W

Table 4: Technical specifications of the Autowash system

S.3 UV-V Lamp

UV-V lamps are used in ecology units to destroy grease and odor particles.

UV-V lamps emit ultraviolet light at a wavelength of 185 nm.

These UV rays eliminate grease and odor particles through two mechanisms.

The first mechanism:

When UV-C rays strike the oxygen gas (O_2) found in the air, due to their high energy, they break the oxygen gas into 2 oxygen (O) atoms. Each oxygen atom that is thus released reacts with the oxygen gas (O_2) in the air, and is converted to ozone gas (O_3).

Ozone gas reacts with elements such as Carbon (C) and Hydrogen contained by grease and odor molecules, converting them into molecules such as CO_2 and H_2O.

The second mechanism:

Since UV rays with a wavelength of 185 nm are exceedingly high energy rays they are capable of breaking down the chemical bonds of grease and odor molecules immediately upon impacting these molecules, and transforming their chemical structure.

UV-V lamps of various lengths and numbers (20"-61") are used in each model of the Geniox VOClean Ecology Unit.

The numbers of UV-V lamps used in the Geniox VOClean unit are calculated based on the following parameters:

- The power of lamps and the amount of ozone they generate per hour,
- Air flow rate
- Dimensions of the ecology unit
- The contact time between the ozone and air
- Cuisine culture/type

"Figure 41" shows a UV-V lamp connected to a power source (ballast).

Figure 41: UV-V lamp connected to ballast

S.4. Bag Filter

Bag filters of various classes (F7, F8, F9) are used as optional material in the Geniox VOClean Ecology Unit.

These filters serve to protect the EPA filter, HEPA filter, heat recovery coil, and active carbon filter that may come after them, extending the the useful life of these components while also preventing drop in their efficiency.

S.5 EPA/HEPA Filter

Epa (E11) and Hepa (H13) filters are offered as optional equipment in Geniox VOClean Ecology Units.

These filters serve to protect the heat recovery coil, and active carbon filter that may come after them, extending the the useful life of these components while also preventing drop in their efficiency.

S.6. Heat Recovery Coil

High temperature air passes through Geniox VOClean Ecology Units that serve to exhaust kitchen air.
Run-around heat recovery coils are offered as optional equipment, in order to absorb the heat from the high temperature air and use it on the fresh air side.

When this coil is in use, the temperature of air that comes out of the coil is lower than the temperature of air that enters it. This in turn raises the efficiency of the active carbon filter downstream of the coil.

Figure 42: Run-around heat recovery coil

S.7 Active Carbon Filter

Active carbon filters comprising cartridges having an external diameter of 140 mm, thickness of 70 mm, and length of 600 mm are used in Geniox VOClean Ecology Units.

Active carbon material has extremely small pores in its structure. The total surface area of these pores is quite high. The small size of the pores help to retain odor particles inside the pores while the exceedingly high surface area enables the material to hale long lasting odor retention properties.

The odor retention efficiency of the active carbon filter is directly proportional to the contact time between the active carbon particles and the air that contains particles which cause bad odors; and to the quantity of active carbon particles.

In order to achieve the ideal contact time, Systemair uses cartridges of optimum size and in optimum quantities in the Geniox VOClean Ecology Unit. Active carbon material of high density is used as an additional measure.

Increasing the number of stages of the active carbon filter is also offered as an option to increase efficiency of odor retention.

The single stage activated carbon filter offers a minimum contact time of 0.1 seconds, while the double stage activated carbon filter offers a minimum contact time of 0.2 seconds.

S.8 Odor Neutralizing Unit

The odor neutralizing unit comprises a small fan, a damper-valve assembly to adjust the quantity of vaporized odor neutralizing agent, the tank that will be filled with the agent, and a pipe that is not conductive of electricity.

The fan inside the unit draws air from the outside environment and passes the air over the neutralizing agent in liquid phase, causing the agent to evaporate. The evaporated agent is ionized under 15,000 Volts by means of the transformer. The ionized agent in vapor form is sent inside the air handling unit through the pipe that does not conduct electricity.

Since the odor causing particles are neutral in charge inside the grounded air handling unit, they are electrically drawn to the ionized odor neutralizing agent, and the two types of particles attach to each other.

At this stage the odor particles are eliminated by the agent and exhausted to the outside environment with the air flow.

“Figure 43” shows the casing of the odor neutralizing unit, and the way it is installed with respect to direction of air flow while “Figure 44” shows a description of the internal components inside the casing.

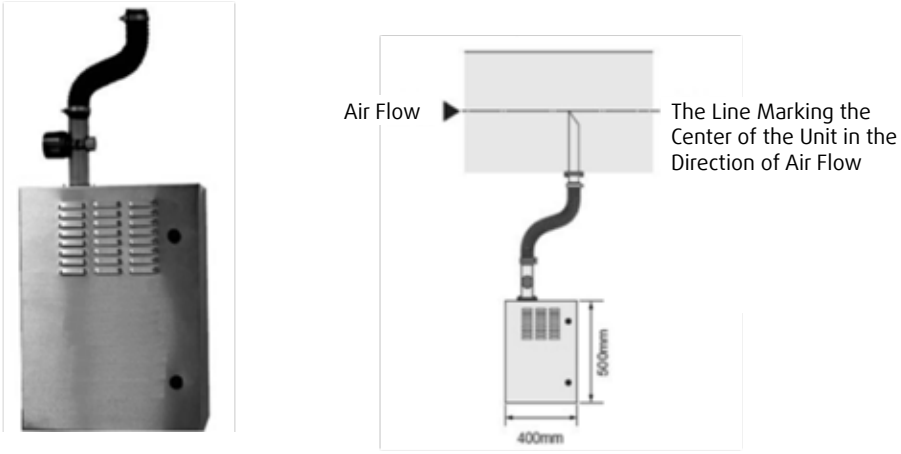


Figure 43: The casing of the odor neutralizing unit and its placement with respect to the direction of air flow

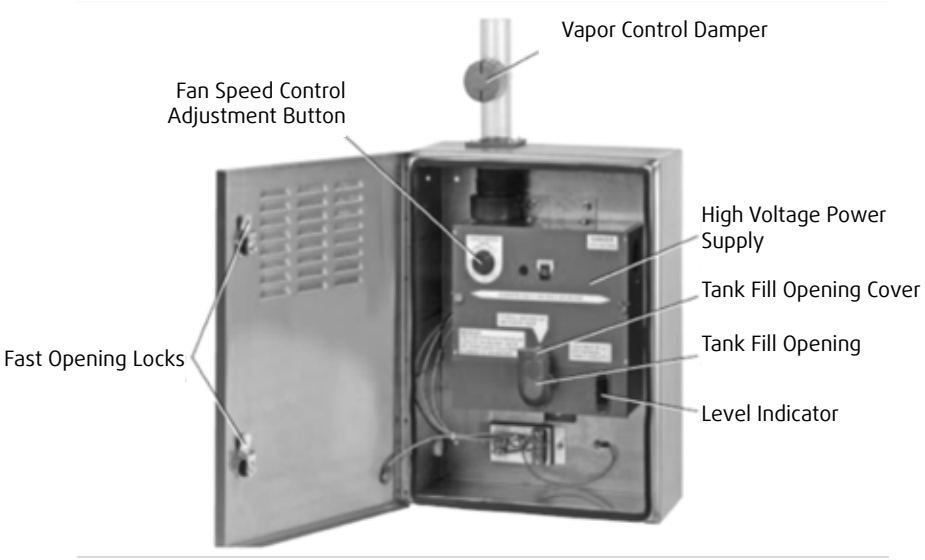


Figure 44: Components inside the casing of the odor neutralizing unit

"Table 5" shows the technical specifications of the odor neutralizing unit.

Electrical Supply	220/240V 50Hz
Maximum Power Consumption	50 Watts
Ionization Voltage	-15kV
Maximum Air Flow Rate	Up to 15,000m^3/
Weight	12.25 kg

Table 5: Technical Specifications of Odor Neutralizer

S.9. Fan and Fan Motor

Single inlet backward curved Plug Fans with high efficiency motors are used in Geniox VOClean Ecology Units. The rotor is directly installed on the motor shaft.

Fan and motor specifications vary according to the desired flow rate and to the components used.

S.10. Silencer

Silencers used in Geniox VOClean Ecology Units are composed of rock wool and glass wool.

Each silencer coulisse with a thickness of 200 mm can be manufactured and used in varying lengths.

The polluted kitchen exhaust air enters the Geniox VOClean Ecology Unit and is scrubbed clean by the unit and discharged as clean air.

Silencers are installed at the discharge sites of ecology units to keep them clean.

Figure 45: Silencer

S.11. Damper Motor (Actuator)

Damper motors that are supplied with automation open damper blades are tasked with opening damper blades when the system starts, and to close damper blades when the system stops.

Damper motors installed in the Geniox VoClean Ecology Unit are of the spring return type, and perform the opening and closing of dampers as ON/OFF.

Since the motors have spring return, the instant the electrical supply to the damper is interrupted, the damper motor will shut damper blades automatically.

Torques of damper motors are selected to suit the sizes of dampers.

Figure 46: Damper Motor (Actuator)

S.12. Potentiometer (MTP10)

Systemair potentiometers which are supplied as an option vary voltage output by altering the resistance in the electrical circuit. When a change is made in the potentiometer, the frequency inverter is initialized to bring the static pressure above or below the static pressure measured in the pressure differential transmitter, changing the fan speed. In this way, you can set any flow rate you wish, provided that it does not exceed the capacity range of the fan or of the fan motor.

Figure 47: Potentiometer

S.13. Differential Pressure Transmitter (PDT75)

The differential pressure transmitter measures the difference in static pressure between the intake and discharge of the fan section, and transmits this information to the frequency driver.

Figure 48: Differential pressure transmitter

S.14. Differential Manometer

The differential manometer which is supplied with automation measures the difference in static pressure between the intakes and discharges of sections wherein filters are housed. When this difference reaches the preset values a yellow or red lamp comes on on the panel, indicating that you need to replace filters.

Figure 49: Differential manometer

S.15. Door Switch

Door switches are used for various purposes in Geniox VOClean Ecology Units. One of these purposes is to cut the electrical supply to the fan when the door of a fan section is opened; and another is to cut the electrical supply to the UV-V lamp when the door to any section is opened, if there is a UV-V lamp in use. A visual representation of the door switch that is used can be seen in “Figure 50”.

Figure 50: Door switch

Notes

Notes

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