

**ELUFT  
AND  
ELUFT ECO SERIES  
AIR SUPPLY SYSTEMS**





**ELUFT AND ELUFT ECO SERIES**  
**STATE OF THE ART AIR SUPPLY SYSTEMS**  
**FOR USE IN INFLATED STRUCTURES**  
**EMPLOYED IN ROOF AND FAÇADE APPLICATIONS**



Supply Air?

Let us take control... individually!



## Contents

<b>Air Supply Systems for pneumatic supported structures .....</b>	<b>1</b>
<b>Functionality of eluft Air Supply Systems .....</b>	<b>2</b>
<b>eluft basic / 150 / 400 / 600 / 900 / 1400 – Blue line.....</b>	<b>3</b>
<b>eluft ECO S / M / L – Green line.....</b>	<b>4</b>
<b>eluft Mobile .....</b>	<b>5</b>
<b>elnic's supporting blower.....</b>	<b>5</b>
<b>Optional Devices .....</b>	<b>6</b>
Master Control Unit .....	6
Network feature.....	6
Wireless Access Point.....	7
Webserver control .....	7
BMS signal interface .....	7
Remote Access Feature.....	8
SMS and email alert interface .....	8
Humidity switch – ECO package.....	8
Air filter cassettes.....	8
Snow Sensors.....	9
Wind sensor .....	9
Automatic switch for dual power source connection .....	10
eluft with UPS.....	10
eluft with 110/115V – 50/60Hz .....	10
Shading support.....	10
<b>FAQ and Answers .....</b>	<b>11</b>
<b>Questionnaire Project Request.....</b>	<b>13</b>
<b>Sample Reference Projects .....</b>	<b>14</b>
<b>Overview specifications eluft and eluft ECO .....</b>	<b>15</b>

## **Air Supply Systems for pneumatic supported structures**

For more than 25 years, inflated structures made of foils (such as ETFE) and fabric (such as PVC, Sefar Tenara, Silicon Glass, etc.) have experienced rapid adoption in international construction markets.

This was due to their architectural and constructional advantages compared to traditional roofing. Their striking appearance, light weight and transparency have spurred leading architects to choose foil and fabric structures in the design of stadiums, airports, swimming pools and railway stations with increasing frequency. This trend occurred in all markets.

Pressurized membrane structures require a permanent mechanical source of air pressure to maintain a high air pressure inside the structure. This source of air pressure must maintain a steady supporting pressure difference of typically 200-350 Pascal above the external environmental air pressure.

The source of air pressure must also be adaptive to varying external loads. In order to handle increased loads, caused by wind or snow, the pressure difference between the interior and exterior of a pneumatic membrane structure must constantly be adjusted to safely carry these additional loads.

In addition to supplying a permanent air pressure difference, the source of air pressure must dehumidify the air it supplies in order to prevent moisture from condensing inside of pillow elements. Dehumidification prevents cloudiness and algae growth inside the pillows.

Based on the needs of designers and construction contractors of pressurized membrane structures and working in close collaboration with specialized engineers, elnic has developed two lines of highly reliable Air Supply Systems: eluft and eluft ECO. These systems provide highly reliable, easy to install and ecologically friendly sources of clean and dry air, the key for a trouble-free pillow operation.

elnic eluft systems have been in continuous worldwide operation since its first application in 2000 (Zoo Munich + Zoo Leipzig) and undergoes continuous improvement.



## Functionality of eluft Air Supply Systems

High-quality components and home-made designs of the modules within the eluft series justify their technological leadership. For executing companies and their consumers this means a considerable economical and ecological advantage.

elnic eluft Air Supply Systems combine the supply of air pressure and dehumidification into one unified unit that consists of redundant fans, condenser or adsorption dehumidifiers, programmable controls and sensors.

All eluft systems can either work as single unit system for smaller projects or be assembled into combinations of multiple units for larger projects. Master units allow the logical combination of several eluft units, along with the necessary sensors, into an easy to operate system in which all of the editing and controlling functions can be programmed using one single terminal.

There are several key features in elnic's eluft systems, which demonstrate their leading-edge technology, high reliability, modular design, economical operation and ecological benefit.

- All eluft systems are built with stainless steel or powder-coated aluminum cases, which provide a reliable and durable housing for the integrated components.
- All eluft systems operate with frequency-modulated redundant fans, which provide the precise air pressure dictated by the control program, and air pressure is continuously monitored by pressure sensors.
- Frequency-modulated fans reduce the required piping sizes and prevent noise from developing in the piping caused by airflow.
- All sensors are electrically hard-wired to the eluft station eliminating imprecise measuring, which may occur by the use of tube-based sensor connections.
- All eluft systems are programmable and computer-controlled to allow easy editing and programming of system parameters.
- Intelligent optional features, such as snow height sensors, SMS error messaging, touch screen panels, network capabilities, humidistat, wind sensor, etc. allow engineers to customize the air supply system for each type of individual application.
- The eluft ECO series provides energy-saving capabilities through the reuse of dried air that is permanently re-circulated in a closed-circuit system.
- All eluft systems can be combined with a master unit, which acts as the main interface for all of the eluft units, connected sensors and controlling devices.
- Network features provide an option to combine the Master unit, the eluft units, related sensors and the operation terminal into one unified system even when individual system components are located in different locations with nearly no distance limitation.
- Integrated adsorption or condensation dehumidifiers are installed in the most efficient way for them to be operated by the control program.
- Humidistats control the humidity of fresh air and allow the operation of the dehumidifiers only when ecologically valuable.

## eluft basic / 150 / 400 / 600 / 900 / 1400 – Blue line

elnic's initial eluft Series has undergone continuous improvements since its first release in 2000. The basic eluft units are available in six setups to match the demand of the individual applications. A single eluft unit provides clean and dry air for roof and façade applications of up to 3700m<sup>3</sup>. Individual combinations of several eluft units match the request for larger projects.

The eluft unit includes three main integrated components:

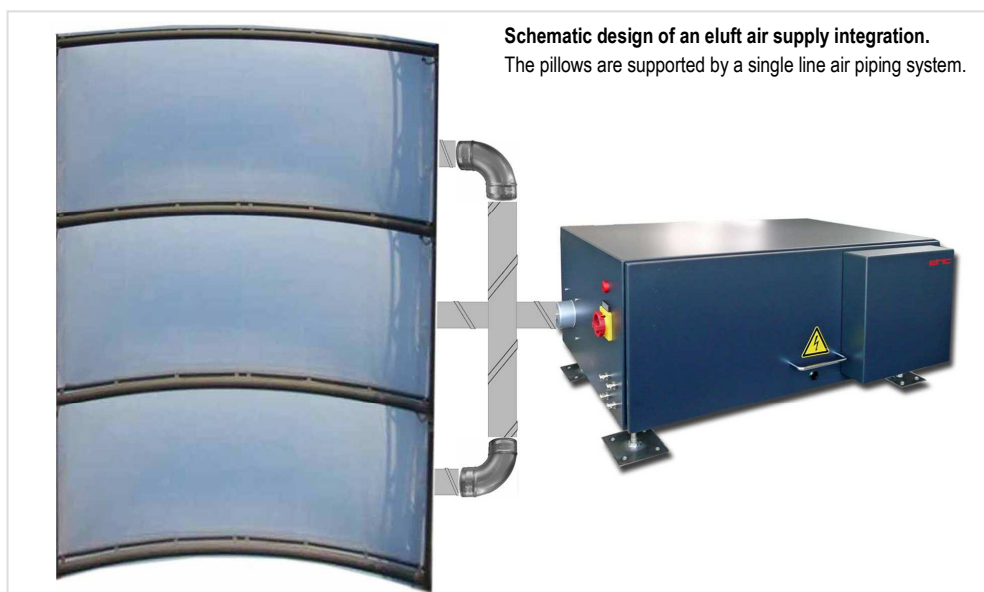
- Dehumidification of air using an adsorption dehumidifier.
- Compression of air using two redundant fans.
- A switchboard with a programmable computer unit and prepared interface sockets for various devices and the standard sensors (min./max. and analog pressure) (except eluft 150 + basic).

The redundant fans automatically switch over every 9 hours. If one fan should malfunction, the second fan immediately takes over, an alarm lamp illuminates and an alarm signal is sent by the control unit. For initial inflation and in case of high leakage due to a damaged pillow or other special circumstances, both fans can automatically be operated in parallel.

The adsorption dehumidifier operates so that any humidity is released in a warm air stream, which exits at the side of the eluft case. No condensation fluid of the dehumidifier can escape from the unit.

The programmable computer control located inside each unit provides a basic display (not in eluft basic) and editing function for initial setup and maintenance purposes. Five free contacts provide alert messages for connections to BMS interfaces.

By using additional components including control valves and additional fan units, the eluft system can be upgraded to move a flexible middle layer inside the pillow, which then causes shade.





## eluft ECO S / M / L – Green line

eluft **ECO** Series is a further development of the basic eluft series. The eluft **ECO** series has been designed to respond to the increasing demand for reduced energy consuming devices. eluft **ECO** is the solution for building energy-efficiently as required in classification such as „LEED“ or „BREEAM“. A single eluft **ECO** unit provides air for applications up to 1800m<sup>3</sup>. Three different sizes are available either as a single unit or multiple unit configurations.

By adding a return path for the dried air, a closed circuit system is created and maintained by the eluft **ECO** system. Only sufficient external air needed to cover leakage (air escaping from the pillows and piping system) is ever added to the closed circuit once the pillows have been fully inflated. Dried air is permanently circulated by an additional fan unit across all areas of the circuit to avoid any possibility of condensation. A humidistat permanently controls the humidity inside the closed air circuit and only turns on the dehumidifier when necessary. Since the dehumidifier consumes the most power in an air supply system, the reduced demand for air drying substantially lowers the overall power consumption of the system, in some cases by up to 70%.

Similar to the basic eluft unit, the eluft **ECO** includes the three main integrated components, i.e. redundant fans, a dehumidifier and a switchboard. However, there are three major differences between the basic eluft series and the eluft **ECO** units. The eluft **ECO** incorporates:

- Large additional overpressure case integrated into the unit.
- Dehumidification of air by a condenser dryer occurs inside the overpressure case.
- An additional circulation fan is installed inside the overpressure case.

Condensed water is collected inside the overpressure case and released on demand by an additional pump. The water is released via an outlet pipe.

Other features and options are similar to the eluft blue line.



## eluft Mobile

elnic's mobile air supply unit "eluft Mobile" was designed as a temporary air supply source on construction sites, for mock-ups and research & development projects.

The "eluft Mobile" provides filtered and dried air for pillows of up to 300 m<sup>3</sup> and pressures up to 1,200 Pascal. An integrated programmable computer-controlled system with display and controls allows precise set-up and control of the system parameters. A current pressure sensor guarantees the exact needed pressure.



The system is designed and built for reliable operation in temporary projects. As the eluft mobile does not have a second redundant fan unit it should not be applied as permanent air supply solution.

## elnic's supporting blower



elnic's air supply unit "supporting blower" is designed for the use at mock-ups, or as a temporary supply air source on construction sites.

The device provides filtered air for cushions of up to 200 m<sup>3</sup> and pressures up to 1,000 Pascal. The volume output can be adjusted by an internal control dial. The air is not dried by the supporting blower as there is no dehumidifier inside.

It can be connected to different currents (110V/240V 50/60Hz) by using the related cable set.

## Optional Devices

Individual application designs such as two, three or four layer pillows combined with the different unique environmental circumstances of the individual locations require advanced system combinations. Therefore all elnic eluft and eluft ECO devices are designed to be supplemented by optional features to meet the most appropriate demands. This allows configuration matching the most economical and ecological solution for the project.

For the individual configuration and layout of eluft and eluft ECO units as well as connected components the specialized elnic Engineers are pleased to assist you.

## Master Control Unit

The master control unit provides superior controlling for complex systems where several eluft and/or eluft ECO devices are combined.

The master control unit is an individual switch board cabinet equipped with a programmable logic controller, a touch screen for editing and visualization and interfaces for connection to eluft and eluft ECO devices as well as all applicable sensors, valves, etc.

The master control communicates via Ethernet among the devices with *Network Feature*. The integrated display can also be complemented by an additional *External Touch Screen Terminal* for placement in remote locations such as control rooms, etc.

The master control system can also perform system functions such as controlling electrical flaps or monitoring the air flow. Like all elufts it may be enhanced by a WAP and/or SMS and email.

Only the MCU offers the BACNet interface as an add-on to exchange live data with any Building Management System.



## Network feature

Each eluft and eluft ECO device can be supplemented by an Ethernet network module which allows communication between the systems as well as to a *Master Control* unit. Weather sensors and certain BMS systems can also be linked to the network. For long distances repeaters can modulate the signal in a way that nearly no length restrictions exist for the network.

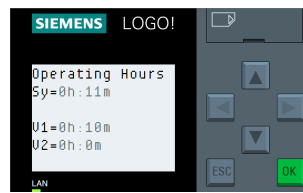
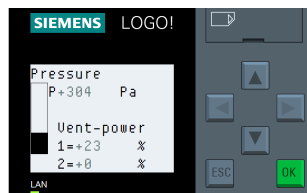
Remote access is also available.

## Optional Devices

### Wireless Access Point

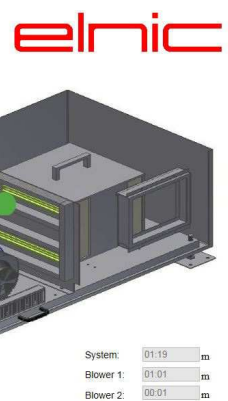
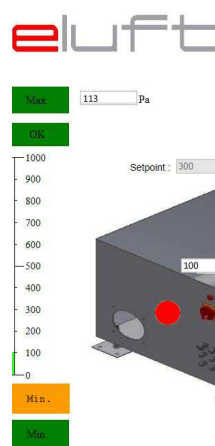
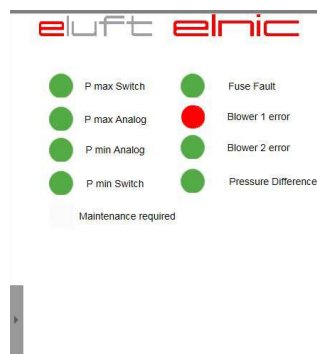


The standard eluft systems (150-1400, ECO) can be connected via a LAN port in the control unit to a wireless access point. This AP is weather resistant and attached to the outside of the eluft station. Within the transmission range devices which are capable of wireless reception (e.g. smart phone, tablet or notebook) can dial into the eluft (password restricted) and show the contents of the internal display on the device. The user can control and administer the eluft. If the wireless access point is connected to a Master Control Unit, the same data can be displayed locally as described under remote access feature.



### Webserver control

The Webserver Software enables the user to view data from the logic controller inside the air machine on a LAN-connected appliance such as a smart phone/tablet/PC, displayed in a graphical, professional man-machine interface (MMI). It not only offers access to the standard PLC interface but also shows real-time data, diagnose pages and errors in a customized site. Combined with the WAP, the air machine PLC can be accessed by WIFI.



### BMS signal interface

As a standard, each eluft and eluft ECO system is equipped with a socket, which provides five contacts (dry contacts) for connection to building management systems. The signals can be dedicated to various status and failure messages.

A master control unit has four potential-free contacts for each connected eluft. It may be extended by a BACNet Interface to exchange live data with the BMS.



## Optional Devices

### Remote Access Feature

This feature allows worldwide remote access to the operation display of the Master Control system via modem. A regular PC with modem connection and an elnic software application acts as extended screen and allows displaying any information in parallel, provided by the Control Panel. Local technical assistance is made easy by the possibility to check all operation, failure and preset parameters from specialists of the membrane suppliers. In order to be able to use this feature, the unit needs to have a master control system and internet access.



### SMS and email alert interface

An optional integrated SMS or email module can send an alert message to several designated phones and/or email addresses at any time to inform operators and maintenance personnel about the system status or to provide alert messages.



### Humidity switch – ECO package

In combination with the eluft blue line machines the use of a humidity switch provides an additional energy saving opportunity. The humidity switch measures relative humidity and acts as a digital switch when the pre-set value is reached. Based on this signal, the adsorption dehumidifier turns off the heater of regenerating air, which is the most power-consuming element in the air supply system. The efficiency of this feature is dependent on local environmental conditions, which have to be considered in the design of the system. The humidity switch is included as standard in our bigger eluft machines and all green line ECO machines.



### Air filter cassettes

Atmospheric pollution can harm certain elements of the eluft and eluft ECO air supply system and can result in fogging and unsightly air contamination inside of the pillows. An air filter cassette is installed behind a protective cover of each eluft unit to filter air entering the system. The G4 filter (normal air pollution) is installed in a slot designed for easy exchange during maintenance. For certain regions, the filter can be replaced by fine filters with increased filter capacity. All filters have to undergo at least a half-yearly inspection and need to be replaced, if necessary even more often. The different filter classes are available in the same size.



## Optional Devices

### Snow Sensors

Three types of snow sensors are available: *snow detection*, *snow height* sensors and *snow scales*. All types can be connected either to a single eluft or eluft **ECO** unit or to a superior master unit which controls several eluft devices.

Basic snow detection sensors can judge between the presence or absence of snow and provide a digital signal. This signal is transformed into a preset increase of pressure to resist against snow load. The advanced snow height sensor allows the eluft or Master control unit to adjust the throughput of air steplessly variable from normal to the maximum preset level. Variable air throughput brings important benefits to the overall system. It does not need to operate with the maximum preset throughput of air, which may cause noise to develop in the piping and cause the dispersion of wet air through the system for a certain time period. This gentle way of raising and lowering the pressure in the pillows also reduces stress in the welded seams of the pillows and in the supporting structure. The high end snow scales take into account the snow height and weight so the eluft can react differently on heavy wet snow or powder snow even if both have the same height.

#### Snow detection sensor

The snow detection sensor provides a digital signal to the control unit when humidity appears on the sensor. The control unit increases the air throughput to the maximum preset level to resist against snow loads if in addition the integrated temperature sensor shows a value less than 3°C. The use of the snow detection sensor should only be applied for pillows where the maximum preset pressure is quite comfortable within the limits of the pillow statics.

It is not recommended to use this sensor in areas of high snow loads and long periods of dry weather.



#### Snow height sensor

The elnic snow height sensor exactly measures the height of accumulated snow between 1 and 80 cm and is resistant to failure under misty or rainy conditions.

The measured height shows on the display and is sent to the eluft or Master unit as an analogue value. The elnic controls transform the snow height value received from the sensor into a required pressure which it establishes as the automatic default for the connected air pressure unit(s). The preset supporting air pressures are steplessly increased by the power-regulated fans.



#### Snow scales



The elnic snow scales consist of a measuring unit and a connection to the eluft machine, which processes the data in its controller. The system works completely self-sufficient. The exact weight is determined with just one load cell. They can also detect snow drifts thanks to the open grid construction. The measured snow loads are converted by the eluft into pressure, proportionally.

### Wind sensor



Based on the dimensions and structural design of the pillows a few applications require the increase of internal supporting pressure under heavy wind loads. The wind sensor provides permanent information on wind speed to the control unit, which adjusts the necessary pressure based on preset parameters. The data from the sensors is monitored by the controls in such a way that short wind gusts do not create a demand for higher pressure.

For winter operation the wind sensor is equipped with a heater. All bearings and screws are made out of stainless steel. Working principle of the wind sensor see FAQs.

## Optional Devices

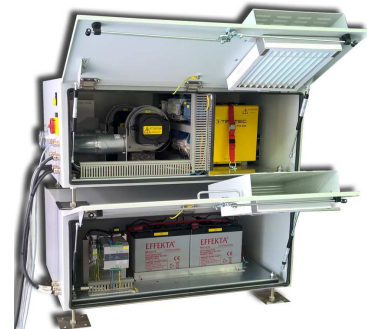
### Automatic switch for dual power source connection

Some projects require the connection of air supply units to two different power sources where one power source serves as a backup function. This might involve the connection to two different transformers feeding the building or the connection to a regular power source and an emergency generator. If two power sources are to be connected to an eluft or eluft ECO system an additional “dual power source switch” can be applied.

### eluft with UPS

eluft machines may be ordered with an own Uninterruptible Power Supply. The UPS is made to order and adapted to the eluft. In case of emergency mode the UPS only keeps the pressure level constant in order to bridge the period of power failure as long as possible.

The bottom casing contains the UPS, which is connected to the eluft in the corresponding casing on top.



### eluft with 110/115V – 50/60Hz

eluft machines can now be bought with an additional device to be able to connect the eluft to 110/115V – 50/60Hz power supply. It is an option for the complete range of ECO machines (green line) as well as for the elufts 150, 400 and 600 of our blue line machines. This is also an option for the UL versions.

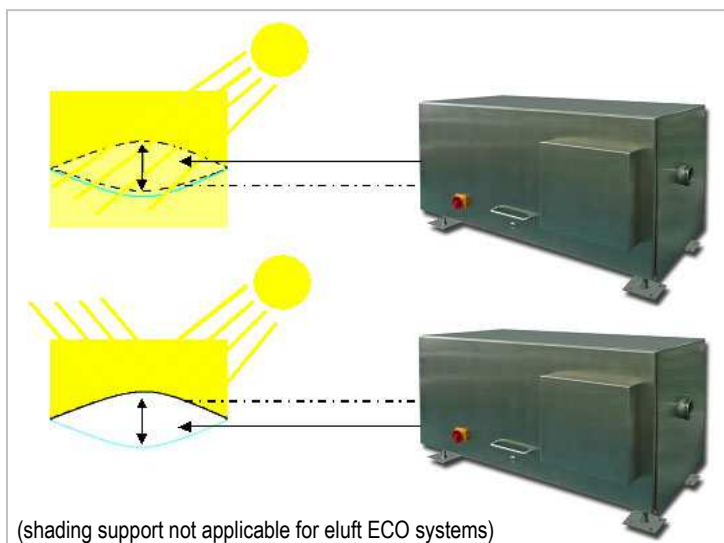
**NEW**

### Shading support

Several projects require a middle layer, which can swing up or down to provide shading by the overlapping of printed patterns. An intelligent combination of valves and pipes inside the eluft can change between inflation of the upper or lower pillow chamber of three layer pillows. Therefore a second pipe is required as shown in the sketch.

To ensure a fast and ecological procedure, the system creates a closed circuit for a short time and circulates the dry air from one chamber of the pillow into the other one, e.g. from top to bottom chamber.

The shading controls are integrated in the eluft unit and make sure that the air needed to move the middle layer



is taken from the chamber which becomes free from air. As the air flowing to shade the pillows does not need to be dried, it becomes more energy-efficient.

It is possible to connect a light sensor to the air machine, which sends a signal to open or close the shading. This is all done automatically.



## FAQ and Answers

### ***How do I arrange the layout for the pipe dimensions?***

Pipe dimensions depend on the length of the pipes, the number of pillows and the number of bends in the pipe. All elements cause resistance for the airflow. To achieve a proper rate of necessary air exchange (for dry air input) a resistance calculation with a specialized software should always be required. elnic is pleased to provide further support in pipe dimensioning based on your individual project data.

### ***Why are main pipe dimensions for elnic systems smaller than from competitive suppliers?***

All eluft and eluft ECO systems contain frequency controlled fans. Conventional fans with only digital (on/off) operation bring either 0% or 100% throughput into the piping system. To track those masses of air volume the pipe dimensions have to be designed accordingly. This might bring the requirement for pipes with dimensions of 50 and more percent of diameter according to the pipes used for elnic systems.

### ***Is dehumidification really necessary?***

Standard central European climate conditions show notable differences in humidity and air temperature. Those values might also change within a short timeframe. Those changes have an impact on the dew point, which might be located on surfaces inside the pillows. Once the dew point is reached a certain amount of condensation water might appear inside the pillow. If this water is not dried by dehumidified air, it will remain in the pillow and create algae. In central European winter times or in areas with general low humidity the control system can reduce the operation of the dehumidifier. In order to achieve a proper drying effect under high humidity, the throughput of dehumidified air should reach approximately 2 full air cycles per day in the system.

### ***When can I expect an amortization of the additional cost for the ECO series in comparison with the basic eluft series?***

In addition to the price difference between the eluft ECO and basic eluft system, the cost for the return pipes have to be considered in the amortization calculation. Based on the experience with recent projects, the amortization period is approximately 3 to 6 years. For systems with an expected lifecycle of more than 20 years the ECO systems will bring a great benefit to the clients. elnic gladly assists you in those calculations.

### ***What is your standard product warranty?***

Our standard product warranty is 12 months on moving parts and there is a 24 month "Bring in" warranty. In case some part breaks down, we can try and solve this over the phone to find out exactly what is broken and what would need to be replaced. elnic is then able to send you a spare part, you would not need to bring in the whole machine. In case a part needs to be repaired, again, the part should be sent to us and elnic can have it repaired and would then send it back to you. Most parts are easy to remove and replace.

### ***What is the expected life of the casing, the moving parts, the air machine as a whole?***

Most casings are made of stainless steel. It is very sturdy and does not ever need to be replaced. It needs to be cleaned every now and then. The fans have a MTBF of approx. 40,000 operating hours. As we have 2 fans inside one air machine, which alternate every 9 hours, this means each fan should "live" for 80,000 hours, being more than 9 years if running constantly. As for the dehumidifier: these have a MTBF of approx. 30-40,000 operating hours, being about 4-4.5 years. The air machine should hold for 25 years if maintained regularly.

### ***Will there be condensation formed from the heating element and if so, is this captured and then drained?***

There is no condensation if the air machine is placed outdoors. The warm humid air exits through the exhaust on the side of the air machine. Should the air machine be placed indoors, the warm humid air should be lead to the outside according to our instructions. There is no condensate tub.

For the elnic eluft ECO versions the condensate must be lead to the outside using a small tube. The condensate is pumped out of the eluft in the form of water. For installation indoors the necessary drainage needs to be provided.

### ***Working principle of the wind sensor?***

The standard pressure setting is 300 Pa. In case the wind is >10m/s for longer than 6 seconds, the pressure switches to 600 Pa (in one step). The increased pressure is held. If the wind speed falls below 0.5m/s, the pressure will be held for another 6 minutes, only then the pressure will switch back to 300 Pa. As soon as the wind speed is >10m/s again, the pressure switches back to 600 Pa. Should this happen during the 6 minutes of increased pressure, it will not drop to 300 Pa but remain at 600 Pa as long as the wind does not drop below 0.5 m/s.



## FAQ and Answers

### ***Is there a documented/scheduled maintenance schedule for these air handling units that lists parts that need replacing over the life of the system?***

elnic can send a maintenance protocol which shows what needs to be checked. It is very important to change the air filter at least every six months.

### ***How do I calculate which size of eluft machine I need for my project?***

In order to be able to calculate **what size of eluft** air machine your project needs, please follow these instructions:

Note: - This is only valid for the standard eluft machines, not for the eco versions. The latter need less fresh air. In this case please contact us for recommendations.

- Our eluft air machines are frequency-regulated and not based on an ON/OFF system, which needs much more power due to the high initial current. The air supply of our system is continuous. Please keep this in mind.
- The maximum air flow rate of an eluft machine is given for safety reasons and thus much higher than the actual provision of dry air.

1. Take the **total volume** of the ETFE cushions.

If you do not know the volume (m<sup>3</sup>) of the cushions, you can use a rule of thumb:

Divide the total surface (length x width) by two, e.g. if you have 500m<sup>2</sup>, you have approx. 250m<sup>3</sup> (please note this is only an estimate as the total volume also depends on the height of the cushion).

2. In order to avoid humidity inside the cushions, with the help of valves in the cushions, the air is renewed completely twice a day.

For our example, this gives us this formula:  $(2 \times 250\text{m}^3)/24\text{hrs} = \underline{20.83\text{m}^3/\text{h}}$  (= flow rate).

3. Add a natural **leakage** of 5-10%.

Leakage is due mainly from the untight piping system and cushions.

In our example that would be  $250\text{m}^3 \times 0.1 = \underline{25.00\text{m}^3/\text{h}}$  air loss.

$$\Rightarrow \Sigma 20.83\text{m}^3 + 25.00\text{m}^3/\text{h} = \underline{45.83\text{m}^3/\text{h}}$$

4. Compare your values to our list of eluft machines:

- a. dry air flow rate: 45.83m<sup>3</sup>/h
- b. application for roof/facade volume: 250m<sup>3</sup>

**RESULT: you need an eluft 150  
as this machine can provide up to 80m<sup>3</sup> dry air per hour  
and the total volume lies underneath the maximum of 300m<sup>3</sup>.**

Specifications	eluft Basic	eluft 150	eluft 400	eluft 600	eluft 900	eluft 1400	eluft Mobile
dry air flow rate [m <sup>3</sup> /h]	80	80	190	275	400	800	190
max. air flow as emergency function [m <sup>3</sup> /h]	120	300	800	1200	1800	2800	190
application for roof/facade volume [m <sup>3</sup> ]	<50	< 300	< 800	< 1400	< 2000	< 3700	<300

## Questionnaire Project Request

<b>Company</b>	
<b>Contact person</b>	
<b>Project name</b>	
<b>Project number</b>	
<b>Date of delivery</b>	
<b>Project location</b>	

<b>Total pillow area of roof (m²)</b>			
Total pillow volume of roof (m³)			
Max. wind load (pascal)			
Max. snow load (pascal)			
Pressure of pillows (pascal)	Standard		Max. <input type="text"/>
Number of pillows (no.)			
Max. area of single pillows (m²)			
Max. volume of single pillows (m³)			
Number of layers (no.)			
Movable inner layer for shading	<b>Yes</b>	<b>No</b>	
Increase pressure of middle chamber in 4 layer pillows	<b>Yes</b>	<b>No</b>	

<b>Total pillow area of façade (m²)</b>			
Total pillow volume of façade (m³)			
Max. wind load (pascal)			
Pressure of pillows (pascal)	Standard		Max. <input type="text"/>
Number of pillows (no.)			
Max. area of single pillows (m²)			
Max. volume of single pillows (m³)			
Number of layers (no.)			

Estimated rate of leakage (%)	
Air exchange/purging air rate within 24 hrs depending on humidity in pillows	

Options	Yes	No
External graphical touch display for status and settings		
WEB SERVER SW		
Master control unit MCU		
Leg extensions		
110/115V 60Hz feature		
Spare filters classes: G4 / F5 / F7 (please enter amount)	G4: <input type="text"/>	F5: <input type="text"/> F7: <input type="text"/>
Snow / rain detection sensor		
Snow height sensor (incremental)		
Snow scales		
Wind speed sensor		
Hygrostat for minimising power consumption (upto eluft 400)		
Automatic dual power source switch		
SMS alert interface		
WAP antenna		

<b>Cable lengths (in m)</b>	
Air machine to nearest pillow	
Air machine to centrally located pillow	
Air machine to furthest pillow	
Air machine to wind sensor (if applicable)	
Air machine to snow sensor (if applicable)	
Tail for power supply to air machine (connected by MC)	

<b>Drawings</b>	
-----------------	--

Options please refer to Specifications Overview of elnic brochure eluft (ECO) systems, pages 15-16, and Optional Devices, pages 6-10

## Sample Reference Projects

The following list indicates selected projects where elnic eluft and eluft ECO units have been successfully implemented over the last 12 years.

Project	Product	Customer
Chinese University <b>Hong Kong, PRC</b>	eluft 150 2 air supply units with dehumidification, wind sensor , WAP	Beijing N&L Fabric Technology Co. Ltd
Papyrus <b>Brunn, Austria</b>	eluft 400 Air supply unit, dehumid., snow height sensor + wind sensor	Canobbio Textile Engineering Srl, Italy
Aida ships	eluft 400 special sea version Air supply unit with dehumidification	Ceno Membrane Technology GmbH
African Union Peace & Security B. <b>Addis Ababa, Ethiopia</b>	eluft eco S Air supply unit with re-circulating air	CenoTec GmbH
Coliseo El Campin <b>Bogotá, Columbia</b>	eluft 400 4 air supply units with dehumidification	Dunn Arquitectura Ligera, Mexico
Atlanta Airport <b>Atlanta, USA</b>	eluft 1400 UL + Master Control Unit 6 air supply units with dehumid., wind sensor, snow sensor	FabriTec Structures LLC, USA
Barangaroo <b>Sydney, Australia</b>	eluft 400 Air supply unit with dehumidification	Fabritecture Australia Pty Ltd.
Atrium Mall <b>Bahrain</b>	eluft 400 Air supply unit with dehumidification, wind sensor	Gulf Shade, Bahrain
BC Place Stadium <b>Vancouver, Canada</b>	eluft 1400 UL certified 5 air supply units with dehumidification Roof inflation/deflation systems with MCU	Hightex GmbH
Zenit Arena <b>St. Petersburg, Russia</b>	eluft 600 x 2 + eluft 1400 x 2 4 units with MCU, LAN, snow height sensor, BACnet	IASO SA Spain
NWC <b>Hong Kong, PRC</b>	eluft 150 4 air supply units with dehumidification, esignaller	Iconic Skin GmbH
Sparkasse <b>Imst, Austria</b>	eluft eco M Air supply units with recirculating air	Koch Membranen GmbH, Germany
Waterpark Tyumen <b>Novosibirsk, Russia</b>	eluft 400 2 air supply units, dehumidification, Pmin + Pmax	Lommeta JSC
Botanical Garden Il Magok <b>Seoul, Rep. of Korea</b>	eluft 900 + 1400 + external display unit 2 air supply units with dehumid., wind s., snow height sensor	MMLite Inc., Korea
Global Intern. Indian School <b>Singapore</b>	eluft 600 Air supply unit with dehumidification, wind sensor	Multimedia Engineering Pte Ltd, Singapore
Sattva <b>Hyderabad, India</b>	eluft 600 Air supply unit with dehumidification	Novum Membranes GmbH Germany
Mall of Africa <b>Johannesburg, RSA</b>	eluft 400 3 air supply units with dehumidification	Novum Structures D
St. Francis Hospital <b>Tulsa, OK, USA</b>	eluft 400 UL certified Air supply unit with dehumidification	Novum Structures LLC, USA
Jaguar Land Rover Gaydon Centre <b>Warwickshire, UK</b>	eluft 400 + eluft 600 x 2 3 air supply units with dehumidification	Novum Structures UK
Sinpas Yapi Endüstrisi ve Tic. AS <b>Istanbul, Turkey</b>	eluft 400 Air supply unit with dehumidification	Onart Tensile Membrane Structures Turkey
Hongqiao Tianmu <b>Shanghai, PRC</b>	eluft 400 x 2, eluft 600 Air units, dehumidification, switch, snow height sensor	Pfeifer Covertex Membranes Co. Ltd
Canary Wharf <b>London, UK</b>	eluft 900 4 air supply units, dehumidification, MCU	Seele Austria
USTA Ashe Stadium <b>New York, USA</b>	eluft 400 UL, hanging version 2 air supply units with dehumidification, deflation	Structurflex LLC, USA
Yonkers Raceway Casino <b>New York, USA</b>	eluft 600 UL certified Air supply unit with dehumidification	Taiyo Europe GmbH
Qianhai <b>Shenzhen, PRC</b>	eluft 900 Dual power Air supply unit, dehumidification, wind sensor	TaiyoKogyo Shanghai
Lilienthalhaus service centre <b>Braunschweig, Germany</b>	eluft eco M + eco L, external display, air valve 2 air supply units with recirculating air	Temme//Obermeier GmbH
Bus station Aarau <b>Aarau, Switzerland</b>	eluft eco L Air supply unit with recirculating air	Vector Foiltec GmbH





elnic GmbH, based in Rosenheim, Germany, has been a reliable partner for over 15 years for technical project and system solutions in the tensile construction industry.

Both air supply systems of the eluft series and the edach, the development and implementation of solutions for convertible components, offer multiple possibilities when realising sophisticated technical parts of your project.

Our experts are available not only for preliminary planning and development but also for realisation and maintenance. We would be glad to hear from you.

**elnic**

email  
web

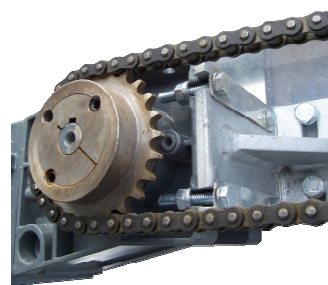
info@elnic.de  
www.elnic.de

Chiemseestrasse 21  
83022 Rosenheim  
Germany

Phone +49 8031 2180 0  
Fax +49 8031 2180 99



**eluft**



**edach**

GREEN Line - best energy ratings for supply air systems											
BLUE Line											
Specifications	eluft Eco S	eluft Eco M	eluft Eco L	eluft Basic	eluft 150	eluft 400	eluft 600	eluft 900	eluft 1400	eluft Mobile	Temp. Blower
height [mm/inch]	700 / 27.56	800 / 31.5	800 / 31.5	400 / 15.75	400 / 15.75	600 / 23.62	600 / 23.62	600 / 23.62	600 / 23.62	620 / 24.41	270 / 10.63
width [mm/inch]	1650 / 64.96	1750 / 68.9	1850 / 72.83	900 / 36.22	1000 / 39.37	1200 / 47.24	1300 / 51.18	1600 / 66.93	1900 / 74.80	800 / 31.5	600 / 23.62
depth [mm/inch]	700 / 27.56	800 / 31.5	900 / 35.43	700 / 27.56	600 / 23.62	600 / 23.62	600 / 23.62	700 / 27.56	900 / 36.22	600 / 23.62	360 / 14.17
weight [kg/lb]	190 / 418	226 / 498	253 / 558	42 / 93	55 / 121	100 / 220	115 / 253	145 / 320	215 / 474	38 / 84	11 / 24
case material	stainless steel	stainless steel	stainless steel	aluminium powder coated	aluminium powder coated	stainless steel	stainless steel	stainless steel	stainless steel	aluminium	aluminium
voltage	230 VAC	230 VAC	230 VAC	230 VAC	230 VAC	230 VAC	230 VAC	400 VAC	400 VAC	230 VAC	115/230 VAC
phase	1	1	1	1	1	1	1	3	3	1	1
frequency [Hz]	50/60	50/60	50/60	50	50/60	50/60	50/60	50/60	50/60	50/60	50/60
average power consumption [kWh/hour]	0.35	0.55	0.9	0.6	0.6	1.2	1.6	2.7	4.9	1.0	0.1
dry air flow rate [m³/h]	--	--	--	80	80	190	275	400	800	190	-
max. air flow as emergency function [m³/h]	380	1200	1800	120	300	800	1200	1800	2800	190	150
max. cushion pressure [Pa]	1200	1200	1200	400	1000	1800	1800	1800	1800	1200	1000
standard duct Size [mm]	100	200	200	125	80	100	100	150	200	80	50
noise level dB(A) in 1m	< 53	< 53	< 53	<55	< 53	< 53	< 53	< 55	< 55	<53	<53
application for roof/facade volume [m³]	< 200	< 1200	< 1800	<50	< 300	< 800	< 1400	< 2000	< 3700	<300	<200
Features (●) and Options (○)	eluft Eco S	eluft Eco M	eluft Eco L	eluft Basic	eluft 150	eluft 400	eluft 600	eluft 900	eluft 1400	eluft Mobile	Temp. Blower
two alternate switched redundant fans	●	●	●	●	●	●	●	●	●	-	-
two frequency controllers for fans	●	●	●	-	●	●	●	●	●	● 3)	-
single fan for permanent air circulation	●	●	●	-	-	-	-	-	-	-	-
programmable controller	●	●	●	●	●	●	●	●	●	●	- 4)
internal display for status and settings	●	●	●	- 1)	●	●	●	●	●	●	-
Wireless Access Point	○	○	○	-	○	○	○	○	○	-	-
external graphical touch display for status + settings (LAN cable up to 100m)	○	○	○	-	○	○	○	○	○	-	-
WEB Server	○	○	○	-	○	○	○	○	○	-	-
master control system	○	○	○	-	○	○	○	○	○	-	-
5 status signals (contacts) for BMS	●	●	●	● 2)	●	●	●	●	●	●	-
shading option	-	-	-	-	-	○	○	○	○	-	-
intake air filter cassette G4	●	●	●	●	●	●	●	●	●	●	-
intake air fine filter cassette M5	○	○	○	○	○	○	○	○	○	○	-
intake air fine filter cassette F7	○	○	○	○	○	○	○	○	○	○	-
analogue pressure sensor	●	●	●	-	●	●	●	●	●	●	-
safety MIN-pressure sensor	●	●	●	●	○	●	●	●	●	-	-
safety MAX-pressure sensor	●	●	●	-	○	●	●	●	●	-	-
snow scales / sand scales	○	○	○	-	○	○	○	○	○	-	-
proportional snow height sensor	○	○	○	- 1)	○	○	○	○	○	-	-
snow detection sensor	○	○	○	- 1)	○	○	○	○	○	-	-
110/115V 60Hz conversion	○	○	○	-	○	○	○	-	-	-	●
hygrostat for power minimizing	●	●	●	-	-	○	●	●	●	-	-
autom. dual power source switch	○	○	○	○	○	○	○	○	○	-	-
wind speed sensor	○	○	○	-	○	○	○	○	○	-	-
SMS alert interface	○	○	○	-	○	○	○	○	○	○	-
leg extensions (500mm for high snow areas)	-	-	-	-	○	○	○	○	○	-	-
eluft T version with 2 front doors	-	-	-	-	○	○	○	-	-	-	-

● standard feature / ○ optional / -- not available

1) switch for summer/winter mode 2) 2x contact (signal) 3) one frequency converter 4) potentiometer

Average power consumption values are based on moderate climate conditions typical of Central Europe and will vary internationally.  
Application dimensions (m³) are based on dry air throughput for systems with leakage of app. 5-10% and app. 2 full air cycles per day.  
All machines are CE certified. Additional international approvals such as UL certification can be provided.