



Big Dutchman®



MagixX & StuffNix

Exhaust air treatment systems
for efficient reduction of emissions from poultry houses

MagixX – the effective pollution abatement facility to separate

The reduction of emissions from livestock housing systems will be even more important in future. To get a licence to build a poultry house, public authorities increasingly demand an exhaust air pollution abatement facility. If the house is located close to a small town, odour emissions play an important role. If the house is located close to the woods, the main focus is on reducing ammonia emissions.

The application of **MagixX** is always the right decision in order significantly to reduce dust **and** ammonia emissions from exhaust air.

With **MagixX-B** and **MagixX-L**, Big Dutchman offers two exhaust air cleaners as a solution to these emission problems. After several years of intensive research work we are able to present you with these two cleaners that fulfil all requirements mentioned above and facilitate the licence procedure for your house, or allow it in the first place.

MagixX-B is designed for the use in broiler houses.

MagixX-L can be used in layer or breeder houses and is characterised by the upstream application of a StuffNix dust filter.

Basic construction of the MagixX-B exhaust air washer

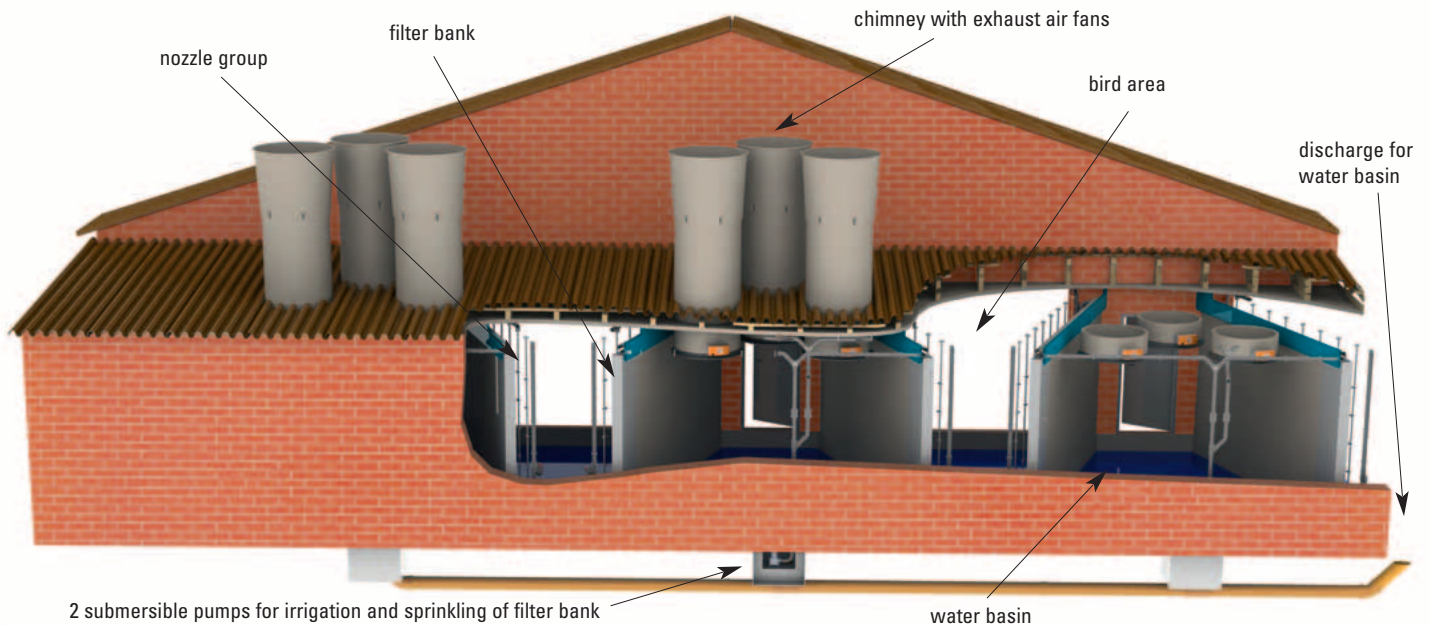


Diagram of MagixX-B exhaust air washer seen from the rear side

How MagixX-B works

MagixX-B is a single-stage exhaust air treatment system with a modular design. Every module is designed for an airflow of approx. 65,000 m³/h. MagixX-B is available with up to 6 modules.

To use MagixX-B effectively the various air currents within the building have to be merged, as the exhaust air is sucked or pushed into the exhaust air washer before exiting the house.

Water is sprayed through a group of nozzles on to the front of the first filter bank at regular intervals. In this way dust is prevented from being deposited on the filter bank and the filling material from becoming congested. This ensures a higher degree of cleaning.

The air flows into the filter bank through which water flows constantly from top to bottom. In this way any dust and ammonia is washed out into the water basin. With acid added (e.g. sulphuric acid) the separation of ammonia is significantly increased (pH-value < 4). In the wash water the ammonia combines chemically as ammonium sulphate. Thus the evolution of ammonia gas is

prevented by this chemical treatment. Dependent on the pH-value of the wash water, the addition of acid is accomplished by an automatic dosing pump. The chemical substances should be stored in a separate service room.

When MagixX-B is installed in a broiler house, the exhaust air is sucked through the filter banks of the individual modules. For this purpose, the modules will be activated one after the other depending on the increasing ventilation requirements in the course of the grow-out. The modular design thus reduces the operating costs significantly.

The basin with the wash water has to be emptied at regular intervals – in broiler growing after every batch – and the filter has to be cleaned with a high-pressure cleaner.

rate dust, ammonia, germs and odour-carrying agents from ho



The nozzle group sprays water onto the front of the filter bank



Back view of the filter – exhaust air chimneys suck the house air through the filter



Side view of the MagixX-B exhaust air cleaner

Constructional details

The individual modules have standard sizes and require these measurements:

- ✓ width: 5.00 m
- ✓ depth: 4.50 m
- ✓ height: 3.00 m.

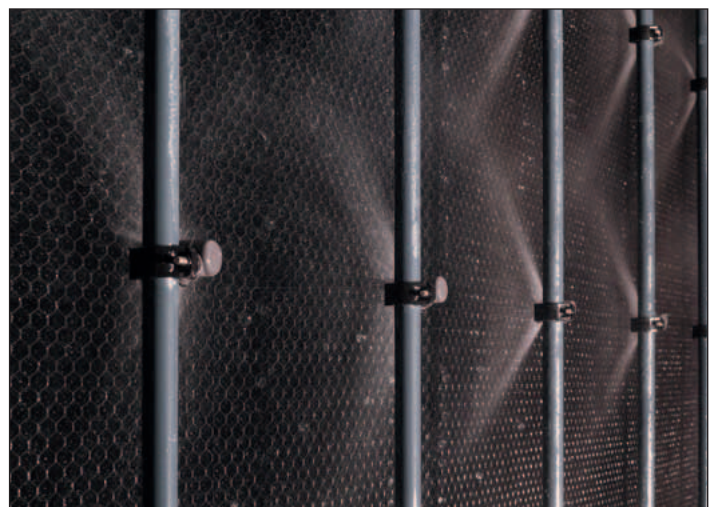
The entire basic area has to be constructed on site as a water basin with a wall height of 40 cm. The height of the water filling level is 25 cm. If MagixX-B is installed at the gable wall, only one water basin is required.

Every module comprises 3 exhaust air chimneys with integrated fans and a total output of 65,000 m³/h.

Up to 6 modules with a total airflow of 390,000 m³/h can be operated this way.

Advantages

- ✓ depending on the ventilation requirements, only the required number of modules are in operation → reducing operating costs;
- ✓ modular design → up to 40 % energy savings in comparison to non-modular exhaust air cleaners;
- ✓ the new design of filling material of the filter bank consists of high-quality plastic material → simple cleaning, long service life;
- ✓ the special arrangement of the filter banks ensures a large cleaning surface → high separation recovery for dust and ammonia;
- ✓ thanks to the separation of dust, germ and ammonia emissions are also reduced;
- ✓ easy maintenance and service operations.



A nozzle group sprays water on special high-quality plastic pads preventing dust from being deposited

Results of DLG certification measurements for MagixX-B

As the first exhaust air cleaner in poultry management MagixX-B has fulfilled the requirements for the DLG label for ammonia and total dust with a minimum separation recovery of 70 %!

During the certification measurements the following separation recovery has been proved:

- ✓ up to 85 % ammonia
- ✓ up to 89 % total dust
- ✓ up to 84 % PM 10 (particle size < 10 µm)
- ✓ up to 62 % PM 2.5 (particle size < 2.5 µm)

Detailed results can be called up at www.DLG-Test.de after receipt of the DLG label.

MagixX-L – the exhaust air cleaner for layer and breeder houses



Using MagixX-L in an aviary house for laying hens

The MagixX-L exhaust air cleaner is a combination of the MagixX and StuffNix exhaust air cleaning systems. The use of MagixX-L is mainly required if extremely high dust loads occur and if the house has to be cleaned of dust and ammonia.

Control of the MagixX-B and MagixX-L exhaust air washers

The electronic control system provides operational reliability and working safety of the whole facility. All operational data can be displayed and controlled on the visual graphic screen. All data can also be transmitted to the office PC via Internet.

Thus a convenient remote record is always available. All recorded data can be saved on a long-term basis. Weekly or monthly creation of a management report is also possible.

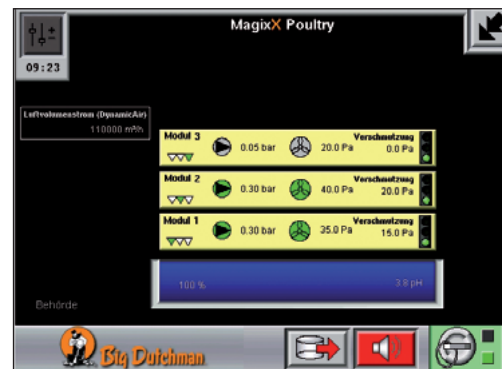


Control computer for MagixX-B or MagixX-L

Daily monitoring of the recorded operational data can be carried out at the touch screen display at any time which is characterised by simple menu navigation. Data is exported simply by USB stick.

The following information can be displayed in detail:

- ✓ pH-value of circulating water;
- ✓ static pressure difference of the individual filter modules;
- ✓ cleaned volume flow of exhaust air;
- ✓ water and electric power consumption.



Touch screen display

StuffNix – an efficient and cost-effective dust filter

StuffNix is a dust filter designed by Big Dutchman for use in poultry houses with high dust loads. It consists of a screen containing a folded plastic element that forces air suddenly to change direction. By means of this simple but effective mechanical principle of centrifugal force, the dust particles are separated from the airflow. They congregate in the V-

shaped chambers outside of the airflow. In this way the cleaned air route stays free, even though the filter fills up with dust particles.

Detailed measurements have determined a total dust recovery of 70 %.



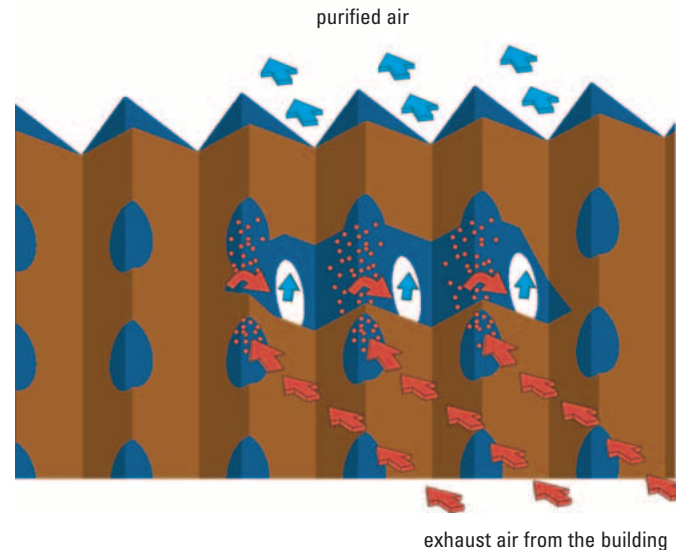
Using a StuffNix dust filter in an aviary house



Rear side of the filter, ventilators suck the air through the filter wall

Advantages

- ✓ high storage ability due to the V-shaped chambers outside the airflow;
- ✓ stable flow resistance, as the airflow route stays free;
- ✓ high stability of shape of the filter walls due to the geometrical structure;
- ✓ long service life of filter walls since they consist of plastic material;
- ✓ fast assembly by drawing the filter elements up to the required working size and attaching them;
- ✓ StuffNix is a dry filter – the use of water is not necessary;
- ✓ significantly reduced capital, operating and maintenance costs compared to a wet exhaust air treatment system.



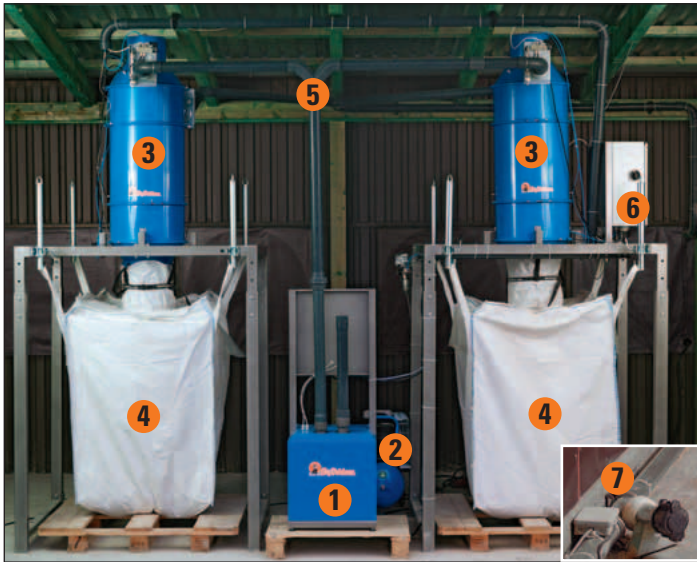
StuffNix operates on the principle of centrifugal force

Semi-automatic dust suction unit – simple cleaning of StuffNix

Depending on the dust load the dust filter should be cleaned at regular intervals. This is very easily done by means of the new dust suction unit. It mainly consists of:

- 1 suction module with turbine
- 2 compressor

- 3 dust separator (cyclone)
- 4 collecting container with attachment (Big-Bag)
- 5 piping to dust filter
- 6 automatic control unit
- 7 flap valve in the house



Dust suction unit for semi-automatic cleaning of the StuffNix filter

Method of operation

The suction module and the connected dust section unit come into operation when the vacuum hose is inserted into the flap valve in the house. Dust is sucked into one of the two separators working according to the principle of centrifugal force. When the maximum filling level is reached, the second dust separator is automatically connected. This allows continuous dust suction. When switching, the flap valve of the first separator is opened and the dust falls into the Big-Bag. In addition, the filter cartridge located in the dust separator is cleaned automatically. This means that only clean air flows through the suction module. This ensures a long service life of the system. The dust can be distributed on to fields together with the poultry manure.



Cleaning the floor behind the StuffNix unit



Cleaning the filter with a brush



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