



Big Dutchman®



MagixX & StuffNix

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

MagixX – efficient pollution abatement facility for the separation of ammonia

Reducing emissions from livestock housing facilities will become more and more important in the future. In order to obtain a building permit for a poultry house, public authorities more often than not require the installation of an exhaust air cleaning system. 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.

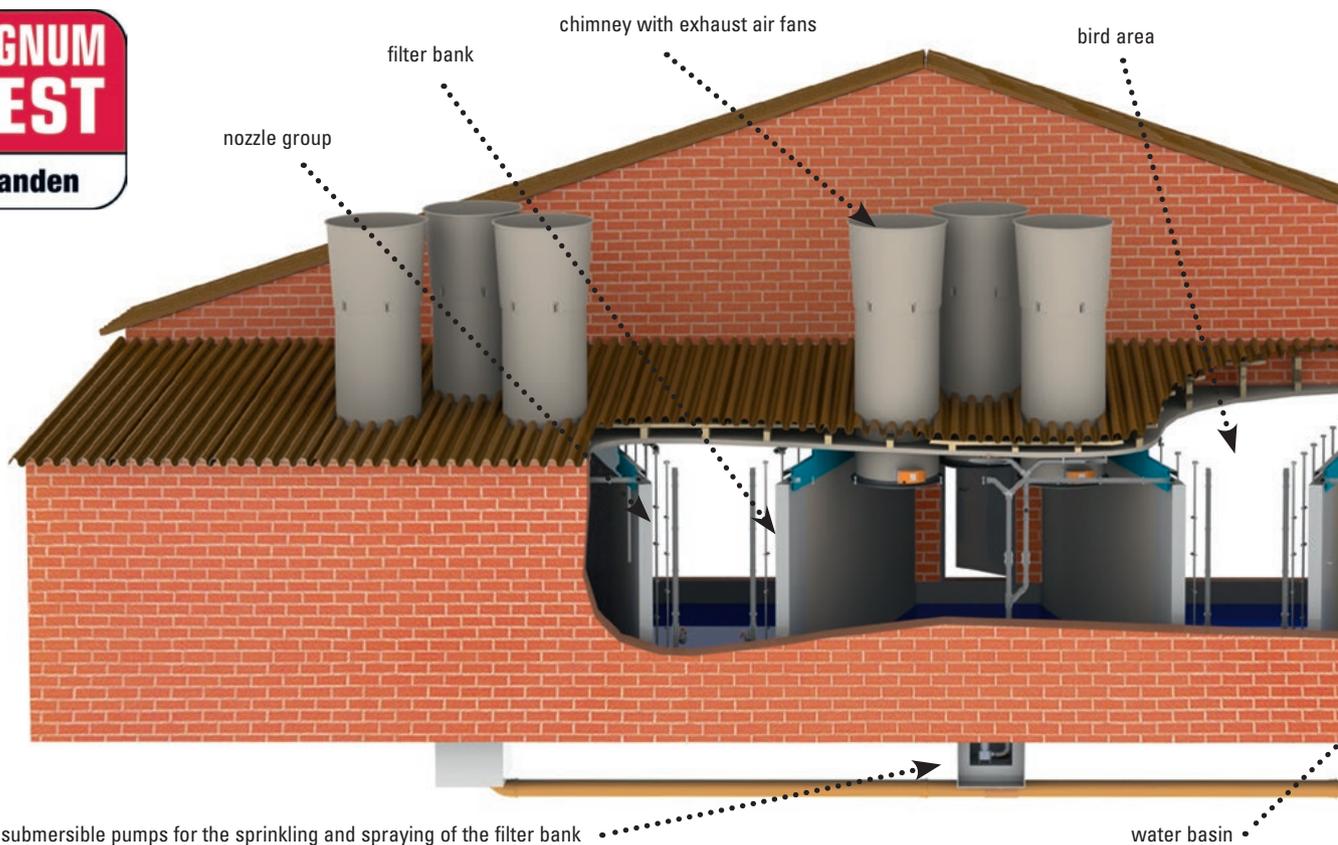
The installation of **MagixX** is always the right decision if the amount of dust and ammonia in the exhaust air is to be significantly reduced.

With **MagixX-B** and **MagixX-L**, Big Dutchman can offer two exhaust air

cleaners as a solution for these emission problems. This facilitates the licence procedure for your house or will 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 installation of a StuffNix dust filter.

Basic structure of the MagixX-B exhaust air cleaner



How the MagixX-B exhaust air cleaner works

MagixX-B is a single-stage exhaust air cleaning system with a modular design. Each module is intended for an air flow of approximately 65,000 m³/h. MagixX-B is available with up to six modules.

To use MagixX-B effectively, the various air currents within the building have to be merged, as the exhaust air is sucked through the exhaust air cleaner and thus cleaned before exiting the house. Water is sprayed through a group of nozzles onto the front of the filter bank at regular intervals. This prevents dust from

adhering to the filter bank and the filling material from being congested, ensuring very efficient cleaning.

The air flows into the filter bank through which water flows constantly from top to bottom. This way, dust and ammonia are washed out into the water basin. The addition of acid to the wash water (pH-value < 3.3) increases the amount of separated ammonia significantly. The ammonia in the wash water is bonded chemically as ammonium sulphate. This chemical reaction prevents the evolution

of ammonia gas (NH₃). Acid is added by means of an automatic dosing pump based on the pH-value of the wash water. The chemical substances have to be stored in a lockable 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 are activated one after the other in accordance with the increasing ventilation requirements during the grow-out. To ensure an even distribution of the emission load

ration of dust, ammonia, germs and odour-carrying agents from



High-quality plastic pads are sprayed with water → dust does not adhere



Front view of the filter: a nozzle group sprays water onto the filter at intervals



outlet for water basin

Constructional details

The individual modules have standard sizes and require the following space measurements:

- ✓ width: 5.00 m
- ✓ depth: 4.50 m
- ✓ height: 3.10 m

The entire base 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 amounts to 30 - 35 cm. Each module comprises three exhaust air chimneys with integrated fans and a total output of approximately 65,000 m³/h. Up to six modules with a total air flow of 390,000 m³/h can be operated this way.



Side view of the MagixX-B exhaust air cleaner

on all modules, they rotate. The modular design thus reduces the operating costs significantly.

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

Advantages

- ✓ modular design → up to 40 % of energy savings in comparison to non-modular exhaust air cleaners;
- ✓ based on the necessary ventilation, only the required modules are in operation → reduced operating costs;
- ✓ 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 performance for dust and ammonia;
- ✓ germ and odour emissions are also reduced;
- ✓ easy maintaining and servicing.

from the house air

Results of DLG certification measurements for MagixX-B

MagixX-B is the first exhaust air cleaning system for use in poultry management which fulfils the requirements of the DLG Signum Test for a separation rate of ammonia and dust of at least 70 percent!

During the certification tests, the following separation rates have been proven:

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

- ✓ up to 62 % PM 2.5 (particle size < 2.5 µm)

The complete DLG test results can be viewed under: <http://www.dlg-test.de/pbdocs/5952.pdf> (in German).

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



Use of MagixX-L in a broiler breeder house

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

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

The control computer ensures the functional and operational reliability of the entire system.

The farm manager can view and monitor the operating data on the visual display.

possible. All recorded data can be saved on a long-term basis. A weekly or monthly creation of a farm report is also possible.

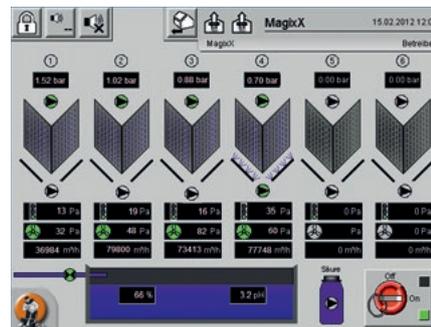
Daily monitoring of the recorded operational data can be carried out easily at the touch screen characterized by its simple menu navigation. Data is exported simply by means of a USB flash drive.

The following parameters can be displayed in detail:

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



Control computer for MagixX-B



Touch screen

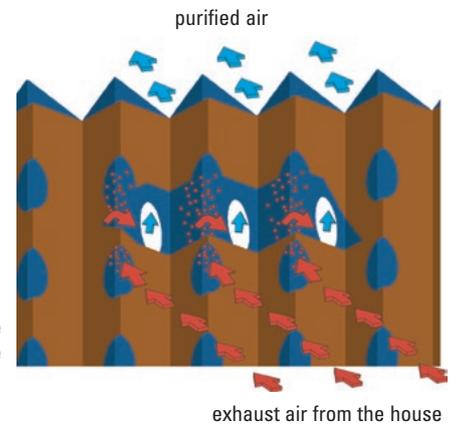
All data can also be transmitted to the office PC via internet. Thus a convenient remote enquiry is always

StuffNix – the 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 patented filter bank containing a folded plastic element (patent no. US 7758666 and EP 1655064) which forces the air flowing through to suddenly change direction. By means of this simple but effective mechanical principle of centrifugal force, the dust particles are separated from the air flow. They accumulate in the V-shaped sedimentation chambers outside of the airflow.

This way, the cleaned air can flow without obstructions even though the filter fills up with dust particles. Professional measurements have determined a total dust separation of up to 70 percent.

StuffNix operates using the principle of centrifugal force



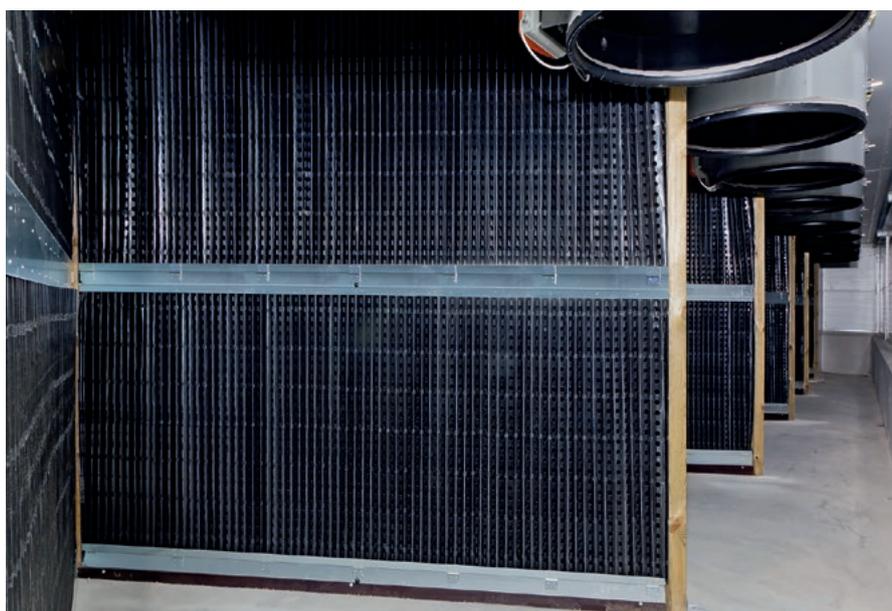
Use of the StuffNix dust filter in a broiler breeder house



Use of the StuffNix dust filter in a broiler house

Advantages

- ✓ high storage ability thanks to the V-shaped sedimentation chambers outside of the air flow;
- ✓ stable flow resistance as the air flow remains unobstructed;
- ✓ good dimensional stability of the filters thanks to their geometrical structure;
- ✓ long service life of the plastic filters;
- ✓ fast assembly as the filter elements can simply be fitted and fixed to the required size;
- ✓ StuffNix is a dry filter – the use of water is not necessary;
- ✓ significantly lower investment, operating and maintenance costs compared to wet-type exhaust air cleaners.



Back view of the filter; fans suck the exhaust air through the filter

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 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 attachments (Big-Bag)
- 5 piping to the dust filter
- 6 automatic control unit
- 7 flap valve in the house



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

The suction module comes into operation when the vacuum hose is inserted into the flap valve. Dust is sucked into one of the two separators which use the principle of centrifugal force. When the maximum filling level is reached, the second dust separator is automatically activated. This allows uninterrupted dust suction. Upon switching, the cover flap of the first separator is opened and the dust falls into the Big-Bag. In addition, a filter cartridge located in the dust separator is cleaned automatically. This means that only clean air flows through the suction module, ensuring a long service life of the system.



Cleaning the floor behind the StuffNix unit



Cleaning the filter with a brush



Cleaned filter



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