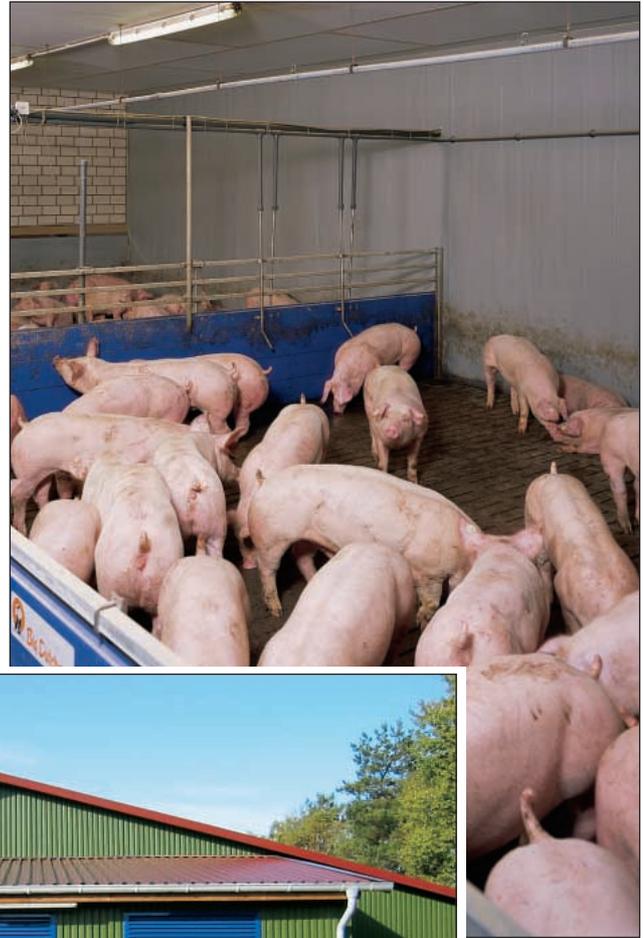
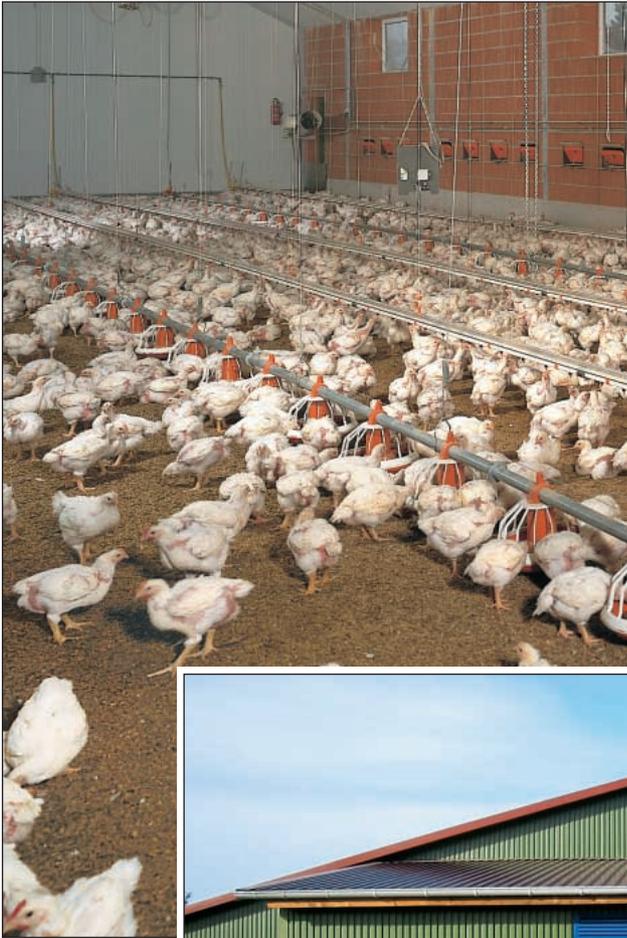




Big Dutchman®



MagixX

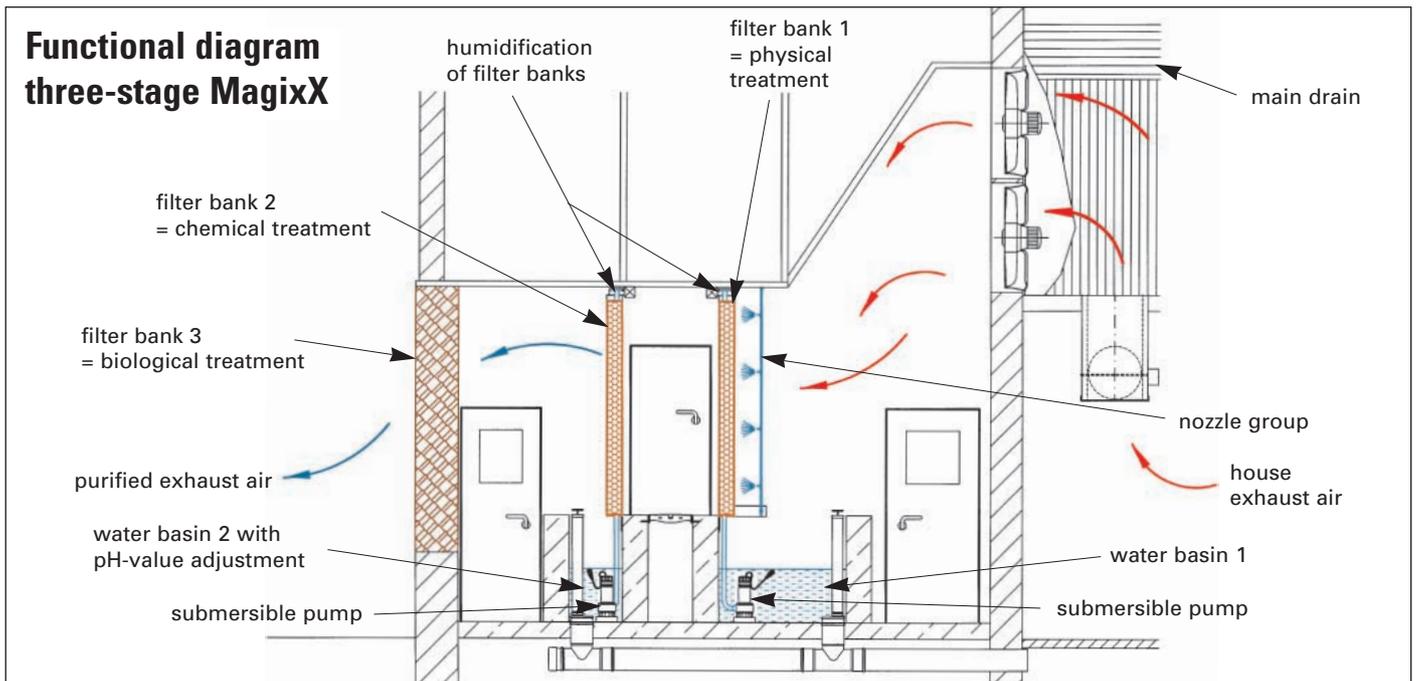
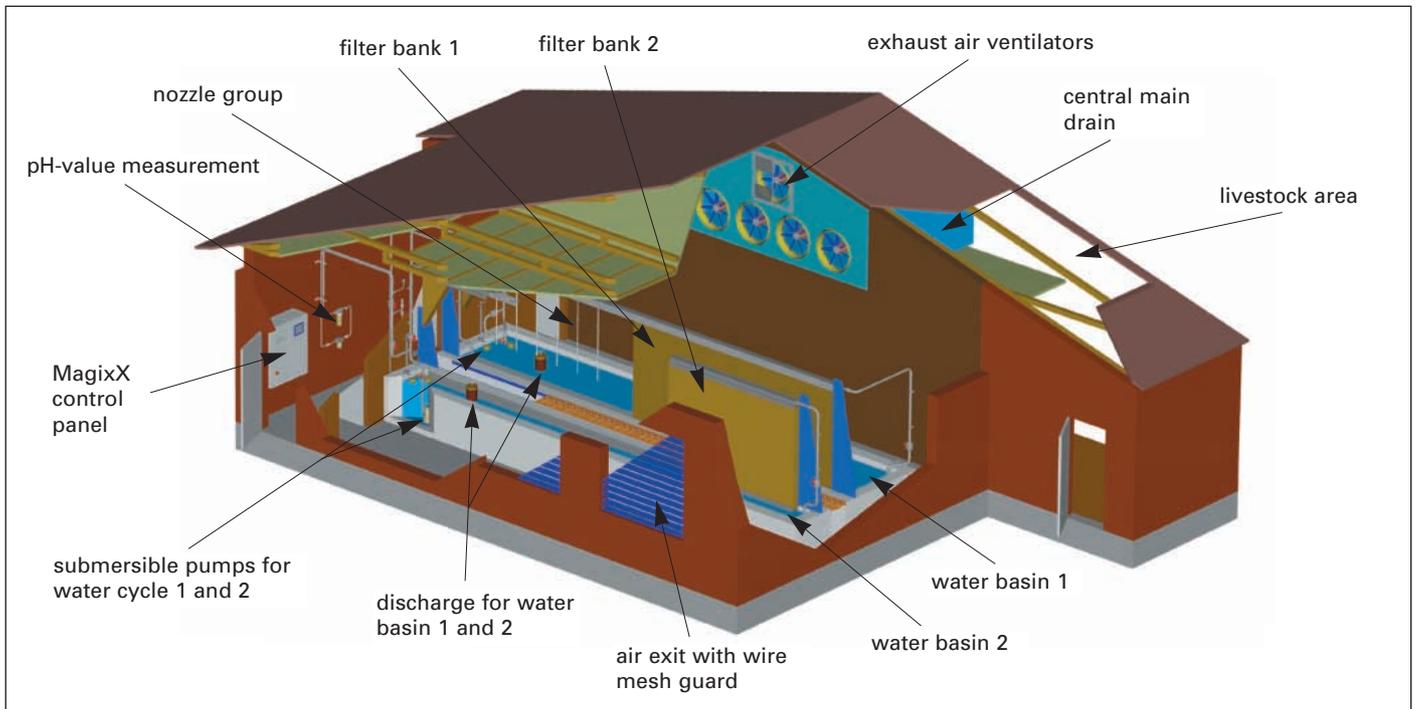
All-purpose exhaust air washer
for pig and poultry houses

MagixX – the effective pollution abatement facility for the separation of dust, ammonia, germs and odour-carrying agents from house air

Clean air is becoming more and more important – not only in the industrial sector but also in the agricultural sector. To get a licence to build pig and poultry houses close to a small town or near to woods, public authorities require an exhaust air pollution abatement facility. Its main purpose is to reduce ammonia, dust and odour emissions to a minimum.

With **MagixX**, Big Dutchman offers a solution to these emission problems. After several years of intensive research work we are able to present you with an exhaust air cleaning system that fulfils all the requirements mentioned above and facilitates the licence procedure for your house.

Basic construction of the MagixX exhaust air washer



How MagixX works

Ventilation in most houses works on the principle of negative pressure: fresh air streams into the house via wall inlets, or the ceiling in the case of spray cooling. Exhaust air ventilators remove the used air. Using **MagixX** the house air is sucked through a large gable opening into an exhaust air washer which is located as a separate entity. The system consists of two or more treatment processes – depending on the application.

In the first, physical, step, water is sprayed through a group of nozzles on to the front of the first filter bank, made of recyclable cellulose. That way the bank is kept from drying-out and dust is prevented from being deposited. Furthermore, the air humidity increases and improves the absorptive properties of the moistened bank surface. The humidified air flows into the first filter bank through which water flows constantly from top to bottom.

In this way, any dust is washed out into the first water basin. Since ammonia and odorous substances are attached to dust, a large proportion of these emissions is already filtered out of the air. The solids precipitate in the basin. The basin is emptied at regular intervals and the solution, containing ammonia, can be used as fertilizer. Next, the air moves into the second filter bank, which is used mainly to separate ammonia, fine dust and odorous substances. With acid added (e.g. sulphuric acid) the separation of ammonia in the second filter bank is increased significantly. In the wash water the ammonia combines chemically



Air enters via door ventilation (1) and is directed into the central main drain via exhaust air valves (2)

as ammonium sulphate. Thus the evolution of ammonia gas is prevented by this chemical treatment. The dosage of acid required depends on the pH-value in the wash water via an automatic dosing pump. The chemical substances should be stored in a separate service room.

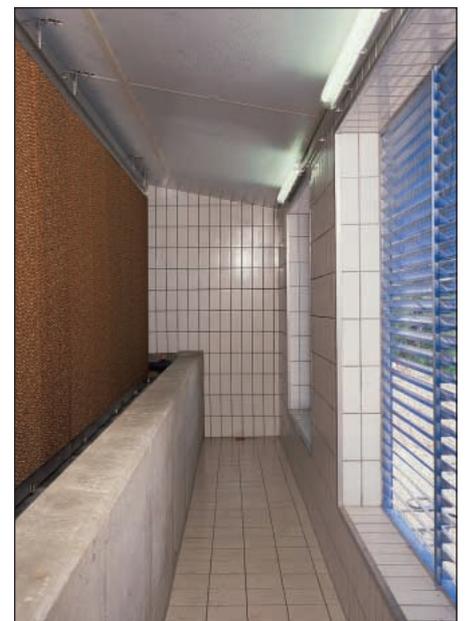
If there is any extra-high need to reduce odorous substances, a third, biological, treatment can be employed. This treatment consists of root timber and is used for the microbial transformation of the odour-carrying agents.



Nozzle groups spray water onto the front of the filter bank so that dust cannot cling to the filter bank. The individual filter chamber doors



have to be closed during operation of the filter. A filter bank inspection aisle lies between filter banks 1 and 2.



The cleaned exhaust air is released to the environment through the wire mesh guard.

Control of the MagixX exhaust air washer



The electronic control system is responsible for the operational reliability and working safety of the whole facility. On the visual graphic screen all operational data can be displayed and controlled.

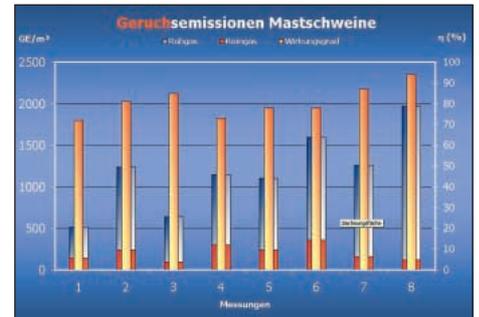
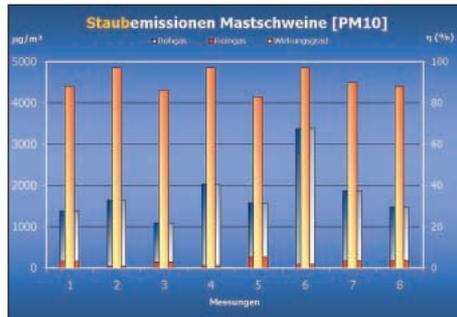
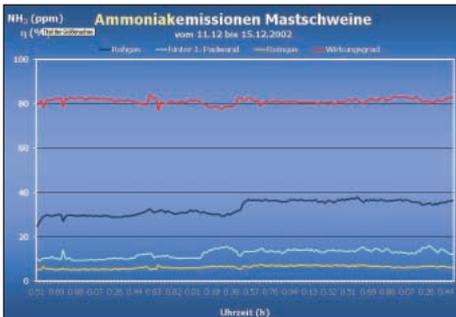
Via a modem all data can also be transmitted to the office PC. Thus a convenient remote inquiry is always available. All recorded data can be saved on a long-term basis. Weekly or monthly creation of a management report is also possible.

Daily monitoring of the recorded operational data can be carried out at the touch screen at any time = simple menu navigation.

The following information can be displayed in detail:

- pH-value of circulating water;
- static pressure difference of the individual filter stages;
- temperature and air humidity of crude gas and clean gas;
- volume flow of ventilators
- water and electric power consumption.

Results of long-term measurement *



Efficiency of ammonia separation

concentration ...	winter	summer
in crude gas (ppm)	24,1	13,7
in clean gas (ppm)	7,2	3,7
efficiency (%)	70,1	72,9

Efficiency of dust separation

fraction	efficiency in %	
	winter	summer
PM 10	94,0	91,2
inhaleable particles	96,4	98,1

Efficiency of odour separation

	winter	summer
crude air (GE)	1858,5	1330,9
clean air (GE)	256,5	248,7
efficiency (%)	83,8	75,6

* An ongoing scientific study of the MagixX three-stage exhaust air cleaning system from winter 2002 up to and summer 2003 carried out by the faculty of agriculture of the University of Bonn. Detailed results can be obtained from Big Dutchman.

Note: the annual mean of odour concentration was under 300 GE and crude gas smell was not perceivable in the clean gas



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